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THE INDUSTRIAL-ARTS MAGAZINE

FEBRUARY 1921

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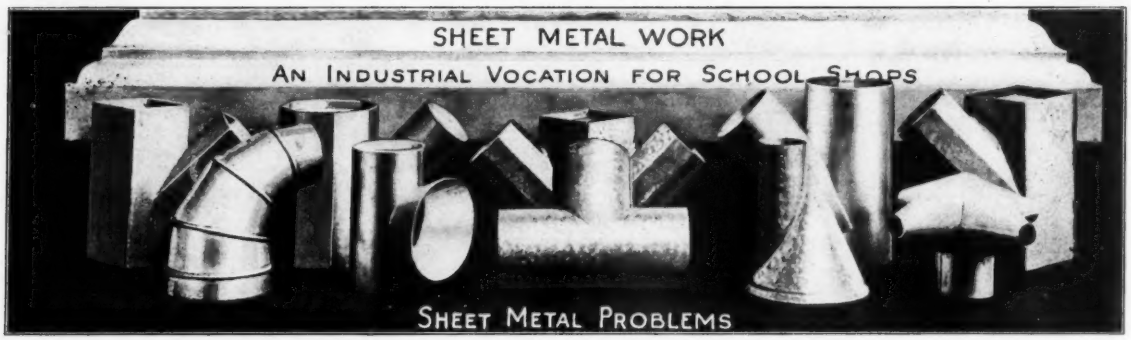

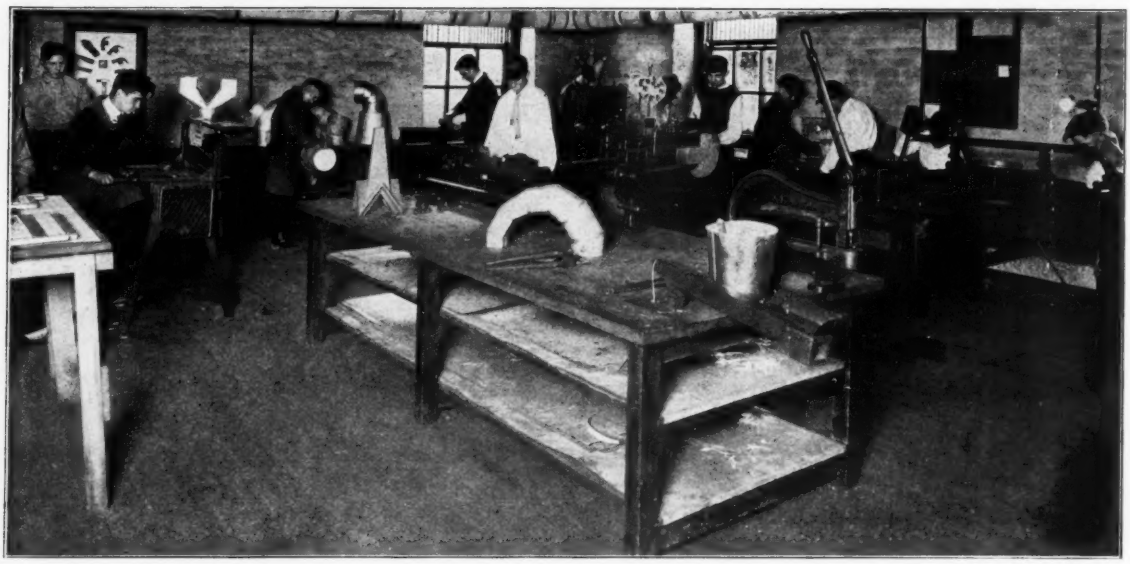

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MEANWHILE, if these hours be dark, as indeed, in many ways they are, at least do not let us sit deedless, like fools and fine gentlemen, thinking the common toil not good enough for us, but rather let us work like good fellows, trying by some dim candle-light to set our work-shop ready against to-morrow's daylight—that to-morrow, when the civilized world, no longer greedy, strifeful, and destructive, shall have a new art, a glorious art, made by the people and for the people, as a happiness to the maker, and the user.—William Morris.

The Side Door
H. W. JACOBS

INDUSTRIAL-ARTS MAGAZINE

Volume X FEBRUARY, 1921 Number 2

PENCIL SKETCHING

Harry W. Jacobs, Director Art Education, Buffalo, N. Y.

PRACTICALLY everybody uses a pencil as a means of graphic expression and the vocations that use the pencil daily as a principal tool will number into the millions. Of this latter group probably five hundred thousand use the pencil in a professional vocation. Few have studied the art of pencil drawing or sketching as a simple, inexpensive and expressive means of representation in their chosen professional lines.

The charm of pencil sketching or pencil painting lies in its power to suggest the many qualities that are found in other mediums. The crisp painted-like strokes produce results and make the pencil the medium of general understanding.

MATERIALS.

Pencils.

Pencils are made in seventeen grades, ranging from the hardest 9H to the softest 6B. From this wide range of graded values I have selected six grades, namely: 3H, H, HB, B, 2B, 3B. Using white—the tone of the paper as a value—because it must always be reckoned with, we have six steps of values to deal with, as shown in the scale at top of Plate A. From this range of pencil values, we must be able to decide which values are best suited for our particular drawing or sketch.

The best grade of pencils should be secured, since they are free from grit and give an even, firm tone of desired value.

In sharpening the pencils care should be taken in not allowing too long a lead to protrude as in No. 5, Plate A, as it will quickly break under firm pressure. About one-quarter inch of lead will give a satisfactory point. (No. 6, Plate A.)

After it is sharpened, the lead is rubbed down on a piece of practice paper, the pencil being held in a natural position for drawing, at about a 45 degree angle. (Examples of points Nos. 2 and 3, Plate A). Sandpaper is sometimes used in wearing down the point, but the pencil should be finally rubbed on paper to insure an even marking surface. No. 4, Plate A, shows the position of the pencil for fine lines or accents in the sketch. A pencil of 2H grade should be sharpened as in No. 1, Plate A to be used in sketching lightly the leading lines of your drawing.

Paper.

The paper should be of a good quality and have a slight grain. Papers with a high or glossy finish should be avoided as well as those with a rough surface, as the strokes cannot be handled to the best advantage on either. The drawings illustrating the text were made on two kinds of paper. Plate A on 2-ply Strathmore and Plates B and C on an off-set paper which can be obtained at any large paper house. Both are durable and have a firm and slightly grained surface, over which the pencil runs smoothly. Regular 9x12 white drawing of good quality, that is used in most schools, is a satisfactory paper.

All beginning work should be drawn on 9x12 paper, gradually increasing the size to 11″x14″ as the work progresses, which allows a greater white space about your drawing as the size of your subject increases.

Erasers.

The eraser is an undesirable element in the work, as the pencil strokes lose their crispness over surfaces where the eraser has been used. However, in removing construction lines and correcting minor errors a soft white eraser is necessary. For removing a portion of the sketch, the kneaded eraser is the less destructive to the surface of the paper.

Portfolios or Drawing Board.

The drawing paper may be thumbtacked on a drawing board or held on a portfolio by elastics. It is always well to place several thicknesses of paper under your drawing sheet to insure an elastic surface or one that will give with the firm pressure of the pencil.

PRACTICE STROKES.

Pencil rendering is not difficult if approached in an orderly manner. It is the directness of stroke, the laying on of pencil strokes at first hand correctly, that gives atmosphere and life to the sketch. The laying on of the pencil strokes is mastered only by constant practice in making firm, even lines and massing of the strokes, as to give an even, firm tone of the desired quality. It is the "ironing out" of the paper with the

With the many mediums of graphic expression that are now in use in our Secondary Schools, too little stress and importance is placed on the pencil as the universal medium of expression. These illustrated articles on the technique of pencil sketching offer to teachers and pupils a systematic course in this subject, with the hope that both teachers and pupils will acquire an avocation that has a direct bearing on their particular vocation.

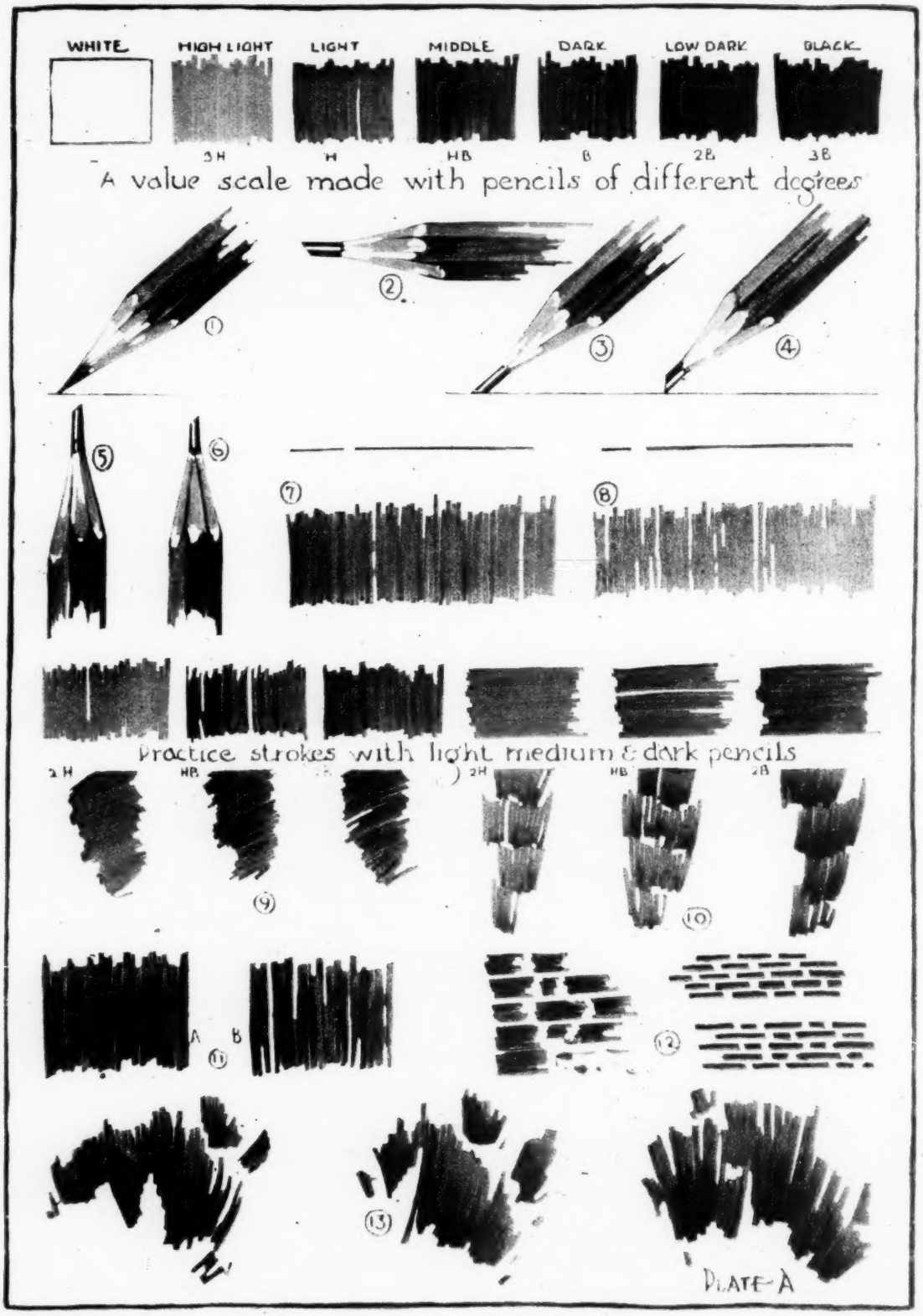

WHITE
HIGH LIGHT
LIGHT
MIDDLE
DARK
LOW DARK
BLACK
3H
H
HB
B
2B
3B
A value scale made with pencils of different degrees
1
2
3
4
5
6
7
8
Practice strokes with light medium & dark pencils
2H
HB
2B
9
10
A
B
11
12
13
PLATE-A

PLATE A.

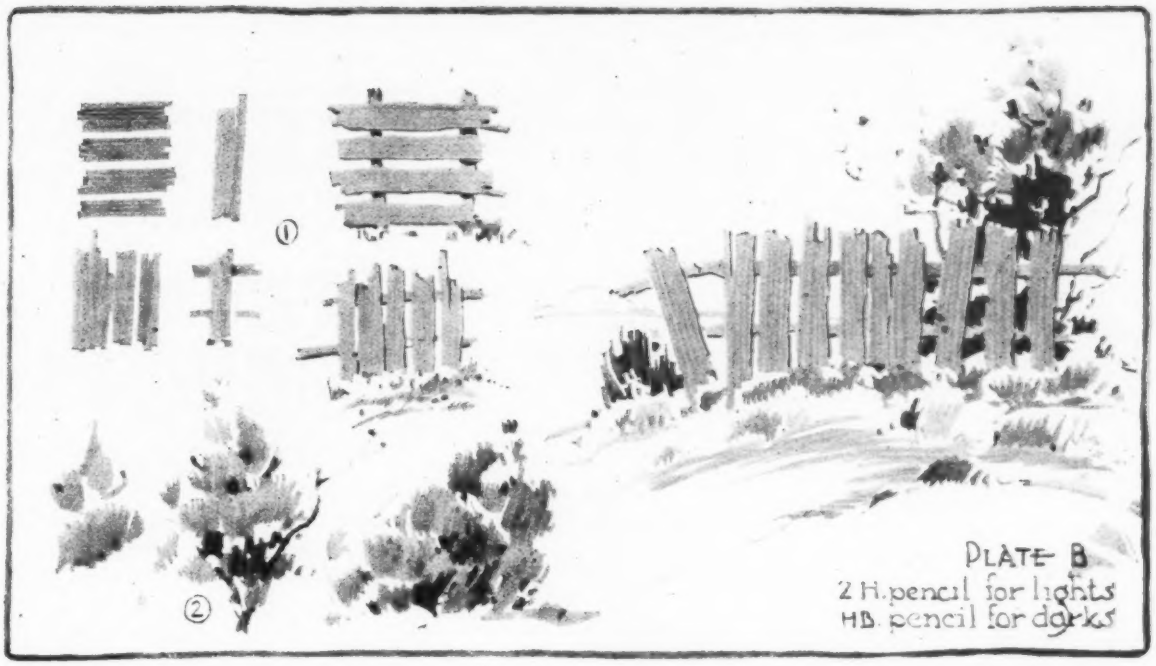


PLATE B.

lead that gives the flat tone effect, No. 7, Plate A. No. 8 shows a woolly stroke due to lack of pressure, thus not obtaining the value of the grade of pencil used.

It is well to begin the practice strokes with three grades of pencils, 2H, HB, and 2B, light, medium and dark, respectively, and lay such strokes as are shown on Plate A, first the vertical strokes and second the horizontal strokes made with each grade of pencil. These strokes are drawn with directness and vigor and are not worked in a laborious manner, keeping in mind that all strokes should receive full pressure and begin and end in a crisp painted-like stroke.

Strokes shown by No. 9 are drawn from lower left to upper right, giving a slanting stroke. These may be drawn downward in the same manner or by not lifting the pencil but allowing it to work over the paper producing a series of slanting strokes from left to right or vice-versa.

Number 10 shows a series of short strokes worked together into a suggested mass form. These are built with a downward stroke and are used in foliage and in shingles and rough boarding.

Number 12 shows the rendering of stones and brick, built together in a wall arrangement. In the first rendering the strokes are of uneven lengths because the stones are of irregular size and shape while in the brick the shapes are more regular and strokes more exact.

The strokes shown in No. 13 are of a free nature, growing from a common center and varying in length. These are used in the massing of foliage and in large flat surfaces when the direction of stroke changes the monotony of the large area.

In making a large mass of any value or values, it is always best to allow some of the strokes to run together and others to separate a little so as to show a little of the white paper as 11B. This gives vibration to your mass and does not present a dead surface as illustrated in 11A.

In sketching in pencil one must keep in mind two important things; namely, that the direction of the pencil strokes must emphasize and express the direction of planes, and second, that the strokes and masses must represent the texture of the subject sketched. Fig. 1, Plate B, shows rendering of vertical and horizontal boarding, the strokes emphasizing the direction of the boards. The same rule holds in the rendering of the simple foliage, Fig. 2.

These short, quick strokes, as contrasted with the long strokes in the boarding, change in direction as the direction of the foliage changes. These two types of strokes are combined in a sketch giving combinations of both strokes.

Plate C illustrates the method of procedure in sketching a window. First the drawing of the leading lines of your sketch, to assist you in laying the masses. Second the drawing of the lighter value, touching in a small area of dark to get the contrasting value relations: and third the lights and darks with accents. Note the amount of white paper that is allowed to show thru which adds sparkle to the contrasting values. Also note the sharp accents with the 2B pencil in the window and under the shadow side of the bricks. This gives added contrast and vigor to the simple sketch.

The full page drawing of "The Side Door" in the Spite House, Marblehead, Massachusetts, clearly illus-

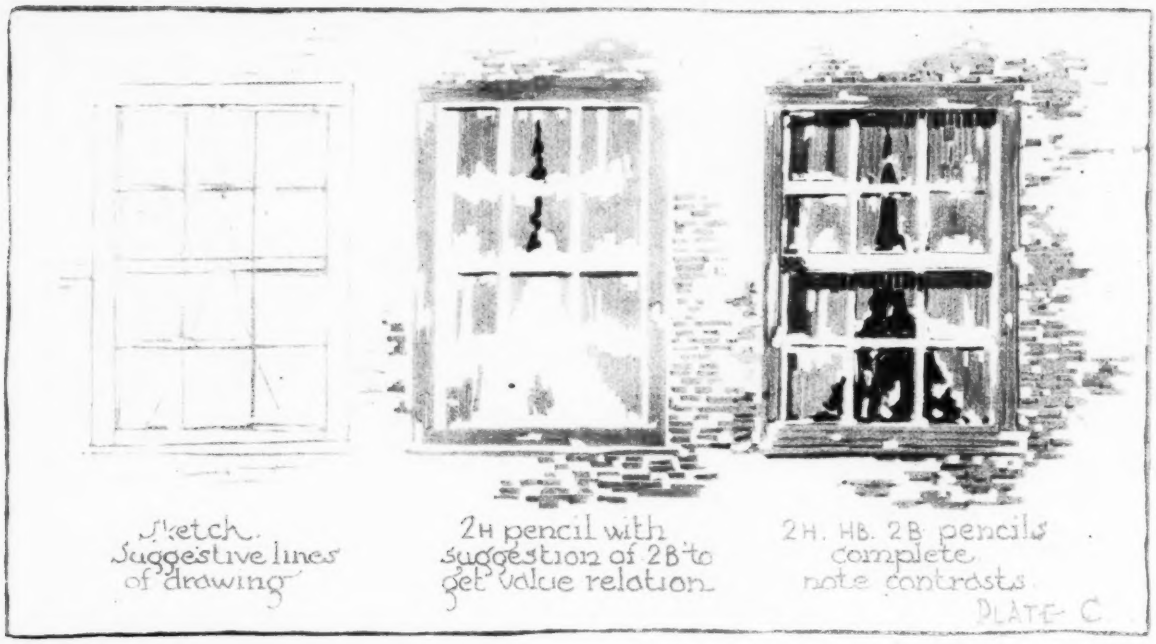


PLATE C.

trates all the strokes, the crispness of line and mass, their direction to emphasize various phases, and the contrasting values, which give brilliancy and spontaneity to the work.

THE NEED OF MORE VITAL CONTACTS BETWEEN THE SCHOOL AND INDUSTRY

DeWitt S. Morgan, Arsenal Technical Schools, Indianapolis

IT IS somewhat difficult to discuss the *need* of more vital contacts between the school and industry without a digression into a discussion of *methods* of establishing and maintaining such contacts. The necessity of contacts more vital is admitted both by schoolmen and industrial leaders with scarcely an exception. There are those who differ as to the degree to which this contactual relation may be evolved, and as to the results which the relation should obtain, but there is no denial of the proposition that a closer relationship between the school and industry will result in benefits to both institutions and to the individuals that both serve. The universal acceptance of the fact that the need exists almost precludes any necessity for a discussion. There is, however, some justification for an analysis of the conditions which make the contacts so necessary for upon our ideas of the reason for the need will be constructed the methods of establishing the contacts. Methods adopted upon the assumption of false needs will fail and will work harm; those which are based upon a true vision of conditions will eventually succeed.

1. In the first place, *the existing social and industrial order has brought about a condition which leaves the average youth wholly isolated from the world in which men do their work, and gives him no opportunity to observe the doing of such tasks as would give an incentive for achievement.* There is a great deal of discussion of the question, "Why boys leave school." We are passing thru a period when the burden of the blame rests with ill-adapted courses of study. There are those who emphasize the failure of the school to discover the peculiar aptitudes of the child and its failure to offer instruction which meets his peculiar needs. But there is a condition which prevails which seems to be more nearly the root of the trouble and which has not been so widely recognized; briefly it may be stated that, *the world of boys and the world of men are farther apart than they ever were before.* A startling change has taken place in the last generation in the opportunities which exist for occupational vision and inspiration. This is not so pronounced in rural communities, for there the contact of boys with the work of men is close and intimate. The acquaintance which a boy has with a genial farmer or successful merchant is frequently a source of much inspiration for similar achievement. This influence in developing ambitions cannot be overestimated; but in cities, which now comprehend over half of our population, boys have a very limited opportunity to become acquainted with men and their work. A talk with the average high school boy of the city reveals a

This paper formed the basis of an address at the Conference of Specialists in Manual Training, Indianapolis, December 8, 1920.

startling aimlessness which can well be explained when one learns that he knows of nothing in the world of occupations that would cause any ambition or arouse any interest. There is plenty of stimulation for possession of wealth; there is everything to urge a boy to *have* things but very little to stimulate an interest in *doing* things. On the one end of the scale is the boy whose father is a discontented factory hand and all he hears of work is that it is something to be avoided because of its utter disagreeableness. On the other end of the scale is the boy whose father is so engrossed in big affairs that all the boy knows of the father's work is the fact of a daily trip to the office, the periodic intervals out of town, and that his father is too busy to be bothered. For both these lads the school has much to do. It should fill the void in the life of these boys which this new situation creates. It should do something which will supplant a desire to have things with a desire to do things. It should create the condition whereby the boy thru school, may get closer to what the world does. In order for the school to perform this new task effectively it is necessary for the school itself to keep very close to what the world does.

This function of the school must be performed in order that vocational guidance, vocational education and kindred programs may accomplish any worth-while ends. An intelligent incentive to do something necessarily precedes the training to do that thing. We cannot hope to teach unless there is a desire to learn. The school as a social agency is called upon in many cases to supply not only the opportunity for an education but also the motive power within the boy for getting it. Training will always involve a sacrifice of effort and of money; of present ease for future good; and where the willingness to make the sacrifice is lacking, as it so frequently is, the school must supply some powerful incentives for making the sacrifice.

This is a problem which the school cannot solve alone. It can only be worked out thru such contacts between the school and industry as will result in bringing the alluring features of skilled occupations to the schools in a very concrete way. The United States census in 1910 lists ten thousand occupations, ten thousand careers to which the school may lead in a broad way. The schools thru co-operation with Chambers of Commerce and other civic agencies, may begin to formulate material which will touch upon the range of industrial activities of a given community, and so present the material in the school that it will incite an interest in industrial accomplishments. The leaders of the industrial life of the community may be brought before the schools from time to time in an organized program for industrial presentation. The Wirt plan of a play-school-work day as tried in New York was fraught with great possibilities for occupational vision. The very fact that there is incorporated within the school such a curriculum as will present the activities of industry in laboratories, shops, office practice room, gardens, etc., will of itself be a potent factor in stimulation of interest in doing things. It will challenge each pupil to consider each line of work in the light of his own interests and aptitudes.

2. *Vital contacts are needed in order that certain influential personalities of industry may be a power in re-enforcing the good influences of the school.* The parent-teacher association functions as a well organized contact between the school and the home and in the grades it is without doubt an organization of great power. There is no question but that its influence extends well into the high school. But we well know that there comes a time in the life of a boy when the precepts of the home seem stilted and those of the school are unwelcome. It is then that the man who would hold the balance of power in the situation is the boy's boss. I refer to the man for whom he works after school on Saturdays, etc. The school should place itself in position to make use of this influence in a very effective way. It should be possible to have the current school record of every boy indicate the name of the man for whom he is working or has worked. Each employer so listed should be made thoroly acquainted with the fact that he may be called upon to take a part in that boy's training, and when the first money earned makes the sacrifice for school seem too great and the excitement of business makes school look dull, then the employer may be called upon to use his influence in getting the boy on the right track in his thinking and holding him to a program of further training and greater usefulness. This presumes a high-minded attitude on the part of an employer which may have to withstand the strain of some personal sacrifice. It is necessary, however, for the community to know that the development of a high-minded citizenship for the future is not alone the work of the school, but a joint task of home and school and church and shop, with each playing an important part in its own sphere. There is no question but that the schools in the adoption of such a program will find a ready response from the rank and file of the big-hearted men of industry.

3. *There is need for very vital contacts in order that the school may more effectively train for the demands of industry; and especially that for the pupil going from school to industry that a minimum of specialized additional training may be necessary in order to make him competent in a specialized task.* (I refer now, of course, to the relation of the all-day school to industry and not to part-time, continuation, and evening schools whose very existence is predicated on vital contacts.) It is here necessary for very close relationships to exist in order that the school, as well as industry, may each know its own particular sphere in training for the tasks and responsibilities of industry. It is possible that industry may be unreasonable in its expectations of what the school is able to do in training workers; and on the other

hand, it is possible that the school may try to do some things which for the interest of the pupil and of industry would be better unattempted. Employers and employees are unquestionably the best judges of the kind of industrial education needed and what part of the boy's training for industry may best be given in school and what part may best be given in the shop. Surely the school in the adoption of a program of industrial instruction should establish facilities for counseling with these groups and shaping courses of study in the light of the needs which their experience discloses. The Technical High School of Indianapolis, in planning the equipment of its laboratories, is just now securing from the plants of the city a statement of the scope of the chemical processes carried on in each, to the end that the applied work in the advanced sciences may initiate the student in the special industrial activities vital to the community.

In this conection it should be possible for industry and the schools to have a clearing house wherein the defects in school training may be centered and get firsthand to the officials who are empowered to adopt a remedy. As matters now stand, the chief agency for airing these weaknesses thruout the country is the public press. The schools have undoubtedly profited from the criticisms from this source. But the lambasting which the schools receive through such agencies reacts very severely upon the morale of the student body and of their confidence in the schools as an agency for effective training. There are frequent aspersions to the failure of the schools, but all too often they are so indefinite as to make it impossible to set about to adopt remedies. In this matter the schools should aid industry in framing its criticisms so that corrective measures may be adopted. The following letter from the chief engineer of a manufacturing plant of an Indiana city to the local vocational director indicates how constructive and valuable a frank expression to the proper authority might be. In commenting on the troubles of starting high school graduates in the engineering department of his plant, the writer says:

"The main trouble seems to be in a total ignorance along practical lines. They have no conception of shop methods or practices. They do not realize that a mechanical drawing is not an art study that may be read in half a dozen different ways but is a series of lines, figures, and notes which can be interpreted in just one way, no matter who reads it.

"The average high school graduate is not good in lettering, and is more or less careless in forming figures. I believe the students should be impressed with the fact that accuracy in a drawing may save thousands of dollars in the shop. I know of a case where a figure 3 carelessly made was mistaken for a 5. Some four hundred expensive parts were manufactured two inches too long. This caused the loss of a great deal of money, and still worse, a lot of valuable time.

"There are four assets a boy must have to be valuable in an engineering department, assuming he has average ability: (1) Technical Training, (2) Practical Training, (3) Accuracy, (4) Neatness. Speed, a valuable asset, is usually acquired with practice and familiarity with the work. The last three of the above points seem to be lacking in practically every high school student we have employed. This fact makes it necessary to actually put a boy thru a course of training the length of which depends on the boy.

"I believe, with most technical men of my acquaintance, that a boy should come from high school with a good foundation in mathematics, a certain familiarity with modern shop methods, and the habits of accuracy and neatness thoroly instilled."

A periodic request from the schools for written, definite criticism of this nature from the industrial concerns of the community might evolve a scheme which would establish courses of study and methods of presentation readily adjustable to the obvious needs of the industrial community.

There are some interesting aspects of the letter from which I have just quoted. Let me call your attention again to the statement which reads, "a boy should come from high school with a good foundation in mathematics, a certain familiarity with modern shop methods, and the habits of accuracy and neatness thoroly instilled." As to when a foundation *is* a foundation in mathematics needs much analysis and open-minded study. In working out that problem the practical engineers of industry can render valuable service to the schools in studying the matter carefully and making definite suggestions to the schools. The development of habits of accuracy and neatness involves the inauguration of methods that are compatible with the psychology of a high school boy. But the question of giving them "a certain familiarity with modern shop methods" involves either a scheme of part-time education or the establishment of a practical shop atmosphere within the school itself. The Technical High School, Indianapolis, is at the present time evolving plans which are designed to meet this situation in certain industrial courses. The plans of the new plant call for one classroom adjacent to the central office for the use of advanced classes in commercial production. These classes are to be made up of picked students from the courses in commerce and to be organized as a relay service to do for the office and all departments of the school those types of commercial work which are ordinarily required in a large plant. From this class will be formed the eligibility list for special recommendation to business firms as the opportunities of the business world come to the school from time to time. The school lunchroom makes it possible to give practical training in every phase of home economics. The classes in cooking will furnish from time to time the actual product sold over the counter, as the preparation of various foods falls within the range of a logical

course of study, i. e., at one time the class will prepare the breads, at another the meats, at another the salads. The utilization of left-overs is a problem which the classes will solve in their turn and each class must work this material over into a marketable product. Herein is an attempt to acquaint pupils with actual shop methods and practices. There are many complications that will arise in attempts to practicalize all courses, but such attempts, wherever circumstances permit, will turn out a school product which will more nearly meet the expectations of industry.

4. *There is need of vital contacts that the schools may render certain peculiar services to industry which cannot be rendered without such contacts.* Lack of contacts with the farms and farmers has robbed agriculture of valuable services which agricultural colleges might have given them long ago. A plan has just been evolved whereby the Federal Bureau of Mines, thru the universities and other state agencies, plans to render practical co-operative assistance to mining industries in solving technical problems for the treatment of ores. The United Typothetae School of Printing of Indianapolis is now acting as a counselor to employers and employees in determining the content of courses offered to apprentices in printing. Industrial plants are now studying the problem of employment as never before. Personnel departments have been established and industry recognizes the need of certain agencies which are primarily educational in their nature. In this work the schools may work with industry much to their mutual advantage. The school record might well supplement the employment record of the shop, in order that employment problems of industry might be simplified and made more effective. Let us hope that a failure to establish contacts will not rob society of the benefits which will arise from the service that students and the school can render to social welfare in this new field of scientific study.

5. There is but one other phase of the needs for contact that I would bring to your consideration. *It is necessary for a very close relationship to be established between the school and the shop in order that each may assume its proper function in civic development.* I have touched upon this above, but in a somewhat different aspect. Our new industrial order has brought us face to face with the fact that industrial plants must assume certain educational functions within themselves for proper training in their specialized tasks. As these functions develop this phase of educational activity will assume increasing importance and influence in shaping certain ideals of our citizenship. If industry will assume responsibility for educational work within itself it must also, for the public good, assume a responsibility for directing that education in a spirit that is true to national ideals. In the fulfillment of this, industry and the school should keep very close together. We shall appreciate more and more as time goes on that the American school and the American shop are agencies fostering the ideals which will make America what she will be. In this work, the school and the shop should be found working very close together with a perfect understanding.

Graphic Aids in Vocational Teaching Analysis

Clyde A. Bowman, Stout Institute

(*Conclusion*)

JOB or topic analysis is closely and intimately linked with the *lesson plan* for teaching. The unit analysis is closely linked with the *unit plan* for selecting and organizing unit courses. The sample lists of headings which follow are for recording job and trade analysis. Similar or parallel study is carried out and recorded in topic and subject analysis. They are for recording data accumulated in the analysis. The first set is for use in connection with trade analysis and the second in connection with *instructive* recording as job analysis is carried forward. The breadth of perspective and thinking involved in job analysis is within the grasp of the individual beginning work in analysis and at the same time it is virtually a cross section of the total to finally come in the analysis of the total trade. After some work in Sheet No. 2 of the series for recording the trade analysis results, the teacher or student teacher analyzing carries the job analysis series thru to completion for several jobs before going to Sheet No. 3. In each job analysis he carries it to and thru a lesson plan before starting on the analyzing of another job.

Headings for data sheets for *recording the analysis of the total in the given trade.* (See The Instructor, the Man, and the Job, by Allen, to be used as reference text.)

Sheet No. 1. On a number of slips of paper put the name of a job which you regard as typical of the work of the various branches of this trade. Classify these any way you desire on this sheet.

Sheet No. 2. Chart the occupational divisions of the trade. Indicate:

a. Major divisions.
b. Sub-divisions.
c. Divisions by units.
d. Divisions by jobs within units.
e. Divisions by parts within jobs.

Note:—Job Analysis data sheets are worked through for several jobs at this point before going forward to Sheet No. 3. (See "Data Sheet for Recording Job Analysis").

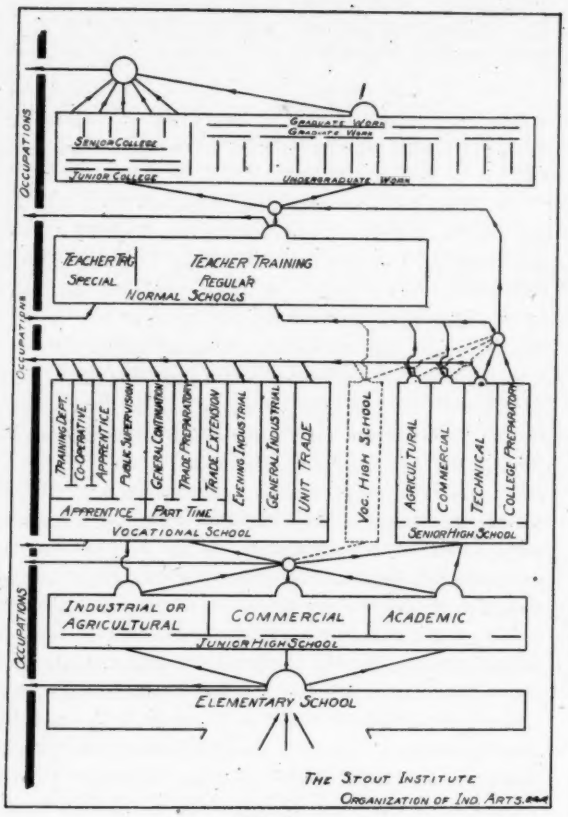


FIG. 8

Sheet No. 3. Arrange the *units* in *instructional order.* Specify checking levels.

Sheet No. 4. Arrange the *jobs* within the units in *instructional order.* Specify checking levels.

Sheet No. 5. Arrange the steps within three typical jobs of the first unit (a simple job, a medium job, and a difficult job). *First,* put them in *production order; second,* put them in *instructional order.*

Sheet No. 6. Classify by *units* and *list by units* the following which must be known for each unit:

Technical knowledge—
- Drawing.
- Mathematics.
- Trade Judgment.

Science.

Trade Materials.

Dangers (Safety First).

Care of Tools and Equipment.

Trade Terms.

Sheet No. 7. Classify the material called for on Sheet No. 6 *by jobs within units.*

Headings for Data Sheets in the Analysis of a Typical Job in a Given Trade.

Sheet No. 1. Take a simple job in your trade such as a beginner or apprentice would have to do and describe in detail the operations necessary to do this job. Put them in their *production order,* omitting such items as getting tools, stock, drawings, etc.

Sheet No. 2. Continue with the analysis, taking the operations listed, and divide each into the *manual or doing* side and the *mental* or thought side.

It will be kept in mind that the *manual or doing* side will have listed only those steps which are *done.* The mental or thinking column *may* have in it a number of things. There may be some things from the field of technical knowledge (technical knowledge sub-divides into drawing, mathematics, and trade judgment); from science, from knowledge of trade materials, from knowledge of dangers (safety first) from information on the care and use of tools and equipment, or from knowledge of trade terms. This sheet will be a complete analysis of what *must* be *known* and *done* to do the job. *The sheets which follow call for selections from the things listed in the mental or thinking column.*

Job.....

Manual or Doing	Mental or Thinking

Sheet No. 3. Continuing with the analysis select from the mental or thinking column on Sheet No. 2 those things which you believe come under the heading of *technical.* These will list under one of the following headings:

Drawing	Mathematics	Trade Judgment

Sheet No. 4. Continuing with the analysis classify the drawing:

Kind? (freehand or (mechanical)	Reads or Makes?	Is it for: Finding dimensions? Learning shapes? Assembling? Getting out Stock?

Sheet No. 5. Continuing with the analysis, classify the mathematics:

Special methods, devices, etc.	Accuracy required.

Sheet No. 6. In some technical work where the skill may be practically nothing the man is paid for knowing how to do the right thing at the right time. He is practically paid for his *trade judgment.* In some trades this is more frequent than others. Continuing the analysis, indicate the trade judgment required, if any, in the job on which you are working out the analysis.

Sheet No. 7. There are a number of facts in *science* which all are agreed are *nice* for men to know in their trade. Continuing with the analysis, list on this sheet those things in the mental or thinking column on sheet No. 2 which come under the heading of science which *must* be known to do the job.

Sheet No. 8. Continuing the analysis, select those items from the mental or thinking column on sheet No. 2 which call for a *knowledge of trade materials.* Separate these as follows:

Sheet No. 9. List the *dangers* in connection with doing the job which are noted in the mental or thinking column of sheet No. 2 and which must be known by a person doing the job. Put them where they belong below.

Occupational	Accidental	Carelessness	Ignorance	Cause
To Self				
To Others				

Sheet No. 10. List those things in the mental or thinking side of sheet No. 2 which an individual doing the job should know about the *care and use of tools and equipment.* Put them where they belong under the headings on this sheet.

Care while using—prevention of abuse.
Care while not in use—protection.
Care to prevent loss—how to know where tools are and where to put them.
Waste.

Sheet No. 11. List the trade terms called for in the mental or thinking side of sheet No. 2 which must be known. Put them in the proper column.

Material	Sym.	Location	Sym.
Operation	Sym.	Special	Sym.

Keeping in mind that this analysis is for the vocational teacher's continuous use in planning and carrying on trade teaching, the vocational teacher in training meets the lesson plan (Harvey Plan) in the first job analyzed. When the first set of job-analysis-data sheets is worked out study is made of the teaching of the job. When deemed expedient the teacher in training does just a little practice teaching at this time. For those who later must swim, and who are inclined to under-rate present instruction in swimming, an initial experience in the water insures close attention to instruction. Thru developmental lessons the divisions of the lesson plan are understood as follows:

1. Purpose.
2. What must be known and done to accomplish this purpose.
3. What pupils already know and can do.
4. What remains to be taught.
5. Teaching.
   a. Purpose.
   b. Preparation.
   c. Presentation.
   d. Application or testing.
   e. Drill.

Scrutiny is made of the data listed in the job analysis sheets. It is seen that this is the material for the first two steps in the lesson plan for teaching the job and, when arranged based on a study of the pupils, the first four. The fifth is studied. Each time a job is analyzed the status of the resulting material as lesson plan data is worked through.

As progress is made on sheets No. 5 and No. 6 of the Trade Analysis series, unit plans for teaching units are worked thru. These call for completion *for the unit* of the first two, later four, headings worked out in a lesson plan. The studies in psychology, teaching vocational subjects, etc., are worked thru as they become necessary in solving the proposition of how to teach the *jobs* analyzed. The organization of related material is studied and worked thru as a natural following up of analysis of units. In other words, his major study is the analysis of the trade, and the analysis of how to teach the trade. These are very closely allied as is indicated in relation between the job analysis material and the contents of the lesson plan. The studies in related subjects, psychology, pedagogy, etc., taught as they are needed, aid in the application and completion of the major study.

As the analysis for teaching progresses study is taken up of the business of the vocational school. Its relationships with other existing schools are analyzed and its direct contact with industry worked out in study of the various kinds of vocational classes and classifications of pupils. Fig. 8 is used in focusing the study of schools. Fig. 9 is used in connection with the working out of the various lines of industrial contact thru vocational schools with industry.

In Fig. 8 the educational agencies thru which industrial and vocational work is operating are represented with some of the possible business relationships between the agencies. Emphasis is placed on trade and industrial in the vocational school area, it being understood that vocational work in agriculture, home economics, and commercial work would be included in a chart of total fields. As indicated in Fig. 8, educational organization tends now to limit the elementary school to six years. This school takes all pupils, usually under compulsory education laws, and puts them in possession of those fundamentals which are the minimum for citizenship participation. Such industrial work as is carried on in this school is to make the prospective citizens better consumers.

Educational opportunity lines from the elementary school lead to the junior high school. Some leave for the occupations. The junior high school, taking the pupils in the seventh, eighth and ninth years of school at approximately the ages of 12, 13, and 14, provides in its industrial work as well as in the other lines, for classification of the pupils. Various administrative means have been used, as indicated at the lower part of the junior high school territory, to provide an initial period for orientation, in the school. Following this period of orientation, based on impressions received by the pupil, decision by the parents, and guidance by the teacher, the pupils are classified into one of the three divisions as indicated.

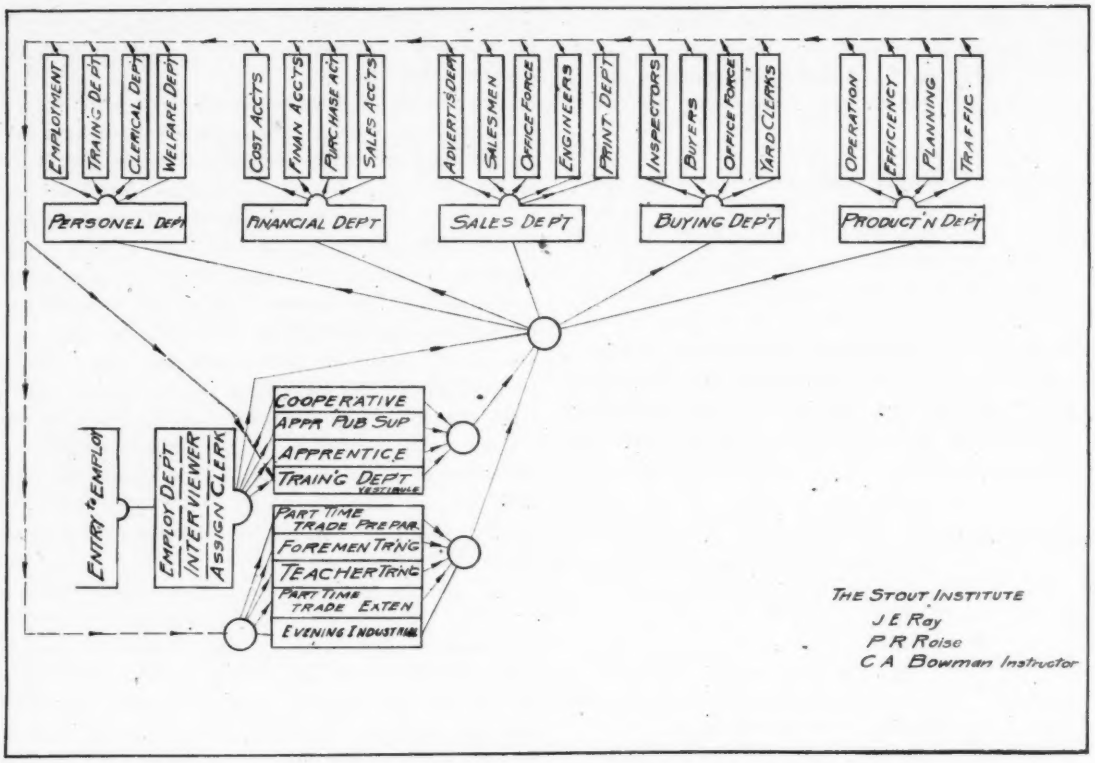


FIG. 9.

Recognition of material
Knowledge of characteristics

From the junior high school in which various try-out studies have been made with resulting classifications of and by the pupils, educational opportunity is open in several directions. Also some go to the occupations. As indicated on the chart there is a direct line from the academic work of the junior high school to the senior high school. There is also a direct line from the industrial work in the Junior High School to the vocational school. There are also possible cross lines from the junior high school as indicated. Usually, however, where a student follows a line other than the direct, assuming that the direct line from the commercial is into the occupations, he will probably lose a little time in making up work not taken in his junior high school course. That is, the industrial group enter to advantage in the vocational school, the academic to advantage in the senior high school, and the commercial enter to advantage in the occupations or the commercial work in the senior high school.

If we think of the elementary school as a level of preparation, the junior high school of classification, the senior high—vocational high—vocational school level becomes one of preparation again. Including the teacher training in the level of preparation we find the junior college growing up as the classification level feeding the senior college with classified students as the junior high school feeds the next level with classified students. It is probable that the vocational high school should shortly be indicated by solid lines as soon as it goes thru the period of initial organization.

Following this survey (Fig. 8) the student teachers carry thru an intensive scrutiny of the industrial environment of the vocational pupils. The purpose of this study (Fig. 9) is to aid in securing close relationships between vocational schools, especially in part-time and evening work, and the industries. Fig. 9 is an assignment chart which is used in working out the classifications of pressure which cause the content of work in vocational classes.

If we consider the individual as passing thru the indicated entry to employment, he goes thru the employment department meeting an interviewer, then to an appointment clerk, and then after classification goes into the plant. There are several possible lines along which this classification may send him. He may, as indicated, go directly into one of the major divisions of the establishment. As indicated the usual one is the direct line into production. If he possesses certain qualifications he may, if there is need for workers, go into one of the other major divisions. The second possible line he may follow is into cooperative training. In this he spends a certain time a week, a month, or perhaps several months, in the plant and then exchanges places with his partner and spends a like period in school. The third possible line of travel is into apprenticeship under public supervision. If he follows this he signs an indenture which puts him in the apprenticeship training in the industrial establishment and under the supervision of the state. The fourth line open is apprenticeship with-

out public supervision. The fifth is the training department.

In the growth of the training department a threefold classification of training is developing. The major portion of the training department work is given to the training of operators. A very much smaller portion of workers are given training somewhat above the level of the operator. A third, and decidedly smaller, group is given apprenticeship training equivalent. These latter are trained in the proportion that the plant needs versatile workers in skilled trades.

Across the top of Fig. 9 are indicated those lines which are open for a worker in employment to secure further vocational training while earning. This vocational training while earning is largely carried on in vocational classes under public supervision. As indicated, however, there is one line which leads from employment back to the training department of the industrial establishment and then to full employment again. This opening is offered in certain large establishments and enables their workers who desire to better themselves to secure further training at a somewhat reduced wage.

In the vocational training available under Smith-Hughes authorization and State authorization, we have the part-time trade preparatory, part-time trade extension, the evening industrial, and the foreman training. The teacher training work is vocational. The general continuation work being what it is classifies outside of the individual's direct vocational improvement. The vocational teacher in training accordingly studies the legal enrollment of each of these kinds of vocational classes and charts in the space at the right the typical teaching content and enrollment make-up of each of these classes. This necessitates a study of federal and state laws, and of typical industrial organization. These studies give definite location for the use of the results of the trade-analysis work. The chief use of trade-analysis results in aid and guidance in teaching less than the total trade or subject as demanded in particular classes and groups of individuals. This last study of lines of industrial contact by vocational schools gives the basic means for a selection of content for vocational training.

With the *analysis* carried thru on the lines as indicated in the foregoing, the *selection* and *teaching* is carried thru and perfected thru adaptation of Kilpatrick's four rating elements: *significance of moment* of possible things for teaching with balance in favor of certain ones; greater *frequency* in probable use by group under instruction of certain things available, for teaching; *economy* in teacher time, pupil time, community finance, etc.; *availability* of certain things possible for teaching, some being better secured in school than out and some being better secured out of school than in. The application is carried forward in practice teaching. The result in the teacher is of profit to the teacher, the pupils, the school as a unit, and the community.

THE CLASS PROJECT IN DESIGN—II

Edward J. Lake, Professor of Art and Design, University of Illinois

THE unsymmetrical letters B, C, D, E, F, G, J, K, L, N, P, R, S, Z, designed as initials by the application of some decorative forms to the letter, furnish projects that require careful balance. These letters seem to face to the right or to the left, according to their form. C, E, F, G, K, L, S face to the right. B, D, J, P, R, Z face to the left.

If these letters are placed within an enclosure, as a rectangle, triangle, circle, oval, or diamond, they may be balanced by allowing a little more space within the enclosure on the side toward which the letters face. Such pronouncement of the letter, with careful regulation of proportion, may result in a very satisfactory initial. Mounting letters cut from paper on geometrical shapes of contrasted tone or color is an excellent exercise in the study of balance and proportion. This simple exercise also brings into consideration the harmony and contrast between the letter and the enclosure. It may be discovered that a letter does not look best on a mount that conforms most closely to the form of the letter. A well-balanced letter, within an enclosure of contrasting form, is more interesting and less conventional than when the letter and enclosure are alike in shape. Harmony overdone may become formal, orderly, and uninteresting. These are important observations for the class in design, and they may be made effective by experiment on a class project.

When some decorative material is employed in conjunction with a letter, the problem becomes much more complex and the possibilities much greater. A point with regard to balance may be noted from the examples given. The letter is balanced in each case by opposition of the decorative material to the action of the letter. In those letters that face to the left, as P, B, D, R, the action of the ornament is dominately to the right. In those letters that face to the right, as E, F, K, L, C, S, the action of the ornament is dominately to the left. By this opposition of the ornament the letter is in each case not only balanced, but supplemented and made complete.

The opposition of the ornament to the action of the letter must not be too evident, however. Evident support on the part of ornament is not pleasing. A thing held together or supported by ornament would be evidently weak.

It may be noted that the ornament conforms to the letters in part and opposes the letters in part. This is

THE DEVELOPMENT OF UNSYMMETRICAL LETTERS AS A CLASS PROJECT.

the double service of all well applied ornamentation. It emphasizes construction, and at the same time conforms harmoniously to that which it decorates. The importance of this idea is evident in natural beauty. The plant is made beautiful by leaves and flowers that conform to and support the structure with added interest. Also, when the snow or frost gathers on the naked trees in the winter and marks out with delicate contrast each branch and twig, we are delighted with the emphasis and variety of form which is evident. The markings of animals and birds conform with and supplement the anatomical structure.

As for the kind of ornament used in the decoration of initial letters, it is evident that the ornament need not look like some natural thing to be effective. There is interesting suggestion of a pine cone in Fig. III; flowers and vines in Numbers I, V, VI, VII, X, XI, XIII, XV; sprays of leaves in Numbers VIII, IX; and conventional lines, shapes, and spots in Numbers II, IV, XII, XIV, and XVI.

Who would choose as most effective the design of a letter that represents a natural thing most nearly like nature? The problem in design is not solved by imitating nature. Nature is a wonderful source of suggestion, and the designer of natural effects must represent natural forms accurately; but the decorator of a letter must not set up a rival interest by representing in a natural way the minute character of some natural form.

Number XIV is evidently Gothic in form; Number XIII is Renaissance in treatment, yet neither of these depend on historical ornament for effect. They are successful or not in the application of the ornament to the letter by conformity and opposition.

The final success of a design is measured by the reaction it gives to the one who observes it. It is probable that some who look at the sixteen letters shown will fail to see one that is decidedly pleasing. The members of a class would certainly not agree in their choice of the most effective letter. Even the teacher's choice should not be imposed with too much emphasis and certainly not without reason.

The problem in design is never solved conclusively. Our development in matters of design and appreciation is slow and perhaps inconclusive, yet develop we must, and the teaching of design is the process of leading to thoughtful consideration of propriety and beauty. A difficult and important task.

FIRELESS COOKERS

L. H. Baxter, St. Johnsbury, Vt.

FIRELESS cookers are by no means a new proposition, but rather an adaptation of an old principle to modern use.

Hot bodies protected by an insulating material retain their heat for a considerable length of time. It is rather a common thing in camp to dig a hole in the earth and place several hot stones within, and on top of this place a pot of beans, covering the whole with hot ashes and earth, and never were beans baked so deliciously as those baked in this manner.

The renowned New England clambake employs the same idea wherein damp seaweed is thickly spread over the embers and clams, preventing the escape of heat during cooking.

The advantages of fireless cookery are many. There is a vast saving of fuel, especially where gas, kerosene or electricity is used. In summer, when a continued fire in the kitchen makes it very unpleasant for the housewife to work, the range fire may be allowed to go out, and the cool, clean fireless cooker does the work far more thoroly than the hot oven.

The dinner may be started in the cool of the morning and then placed directly into the fireless cooker, and left with safety from fire or burning, and the meal will be ready when wanted without further tending.

Cheaper cuts of meat may be utilized by using the cooker for, altho not as fine in texture or flavor, are as fully nutritious, pound for pound, as the more expensive cuts.

Long cooking in a low temperature, such as the fireless cooker offers, improves both texture and flavor of the cheaper cuts of meat.

In experimenting with some of the cookers made by eighth-grade boys, it was found that they fully equaled in result the commercial cooker costing from 25 to 30 dollars, while they cost the boys something like five dollars.

Oatmeal put into these cookers at 8 o'clock at night, hot from the stove, taken out the next morning, twelve hours later steaming, so that it was too warm to eat, proved conclusively that there was no witchcraft in making a fireless cooker, but well within the capabilities of an industrious lad.

TYPICAL FIRELESS COOKERS MADE BY THE AUTHOR'S STUDENTS.

The outer part of a fireless cooker is a box large enough to contain the insulating material, a kettle for holding the food, preferably a double boiler, a container for the kettle, and a hot plate.

The accompanying drawing shows a box the proper size for a one-hole fireless cooker.

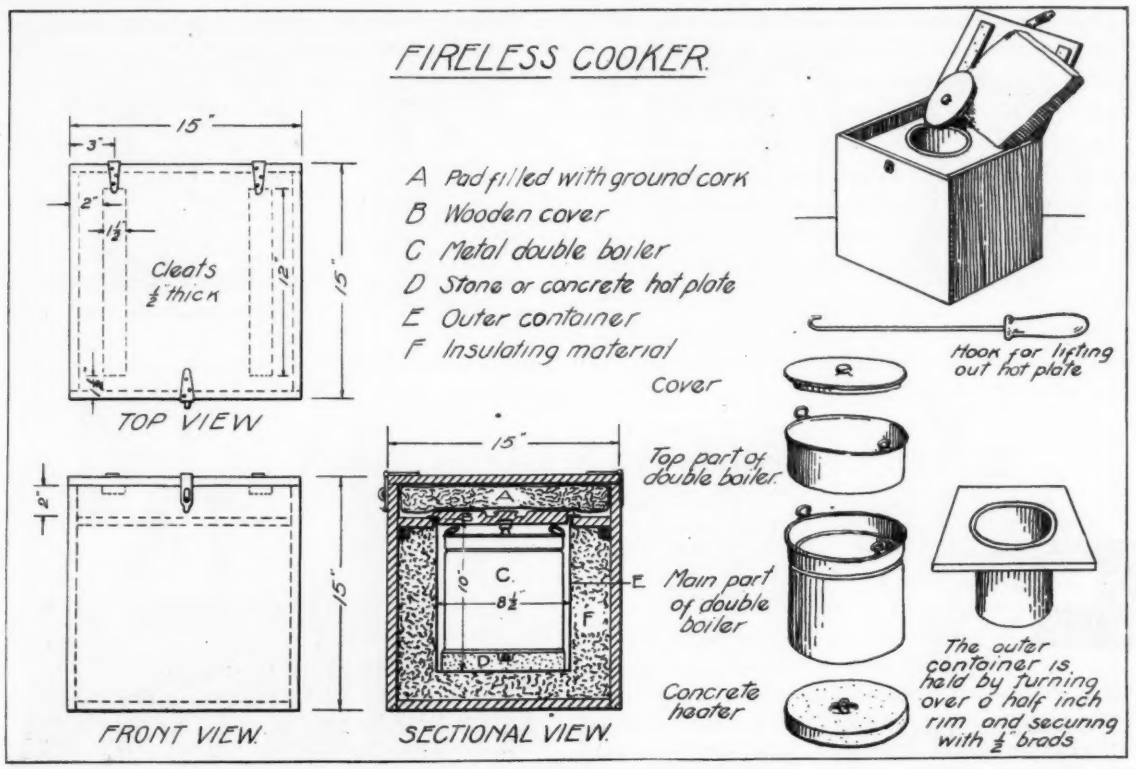
Spruce, a half inch in thickness, is a good wood to use. It will be necessary to join two or more boards to make the required thickness and this should be done by making tongued and grooved joints. One-quarter inch dowels and hot glue may be resorted to.

The ends should be ½″x14″x15″, and the front and rear ½″x15″x15″. These pieces should be assembled by nailing the front and rear to the two ends. Hot glue may be used in assembling.

The bottom pieces will be ½″x14″x14″ inserted and nailed in a similar manner.

The cover is ½″x15″x15″ and attached by means of two 3″ strap hinges. The cover is also reinforced by two cleats ½″x12″ screwed to the underside, 2″ from the edge.

A shelf to hold the outer container is next made ½″x14″x14″ and secured below the top edge, resting



DETAILS OF A FIRELESS COOKER.

on supports 5/8"x5/8"x14", which are screwed to the sides by 1" flat-head screws. This shelf has a hole cut in its center just large enough for the outer container to slip into. This outer container is 8½" in diameter by 10" deep with a ½" rim, turned over on its upper edge and held by ½" brads to top of shelf.

If a sheet metal outfit forms a part of the manual training equipment, all metal work can easily be made by the boy, otherwise a local tinsmith will have to be requisitioned.

Sometimes all the containers can be obtained in a hardware store, saving time and trouble in making them.

After the outer container is securely in place, the cooker should be turned upside down and a 3" hole cut in the bottom, as a means for filling in the insulating material.

The material should be thoroly shaken down and worked around in all corners with a stick. Recover the hole with a piece of tin tacked on.

A variety of material may be used for insulating. Crumpled paper is very satisfactory. Ground cork, hay, excelsior, Spanish moss, and wool are also quite suitable. Altho more expensive, asbestos and mineral wool are perhaps the best, having the advantage of being non-inflammable.

A cushion of a size sufficient to fill the space between the top of the container and cover should be made and filled with the same material used in the other parts of the cooker.

A cover, either metal or wood, turned out on the lathe, must fit over the outer container as shown in the sectional view, with a ring or some other means of lifting it, as shown at B.

The inner container, or the one which contains the food, is made in two parts, similar to any double boiler, as shown in sketch.

The upper part of the inner container is held from slipping into the lower part of the boiler by a groove crimped into the side of the main part of double boiler, as shown.

The hot plate can easily be cast in concrete, using a pie plate of suitable size for the form and inserting a good-sized staple for lifting.

The lifting hook is made from a piece of telephone wire inserted in a handle.

The hinge hasp holding the cover down may be secured by a halter snap.

The double hole cooker shown in the photograph is made on the same principle with a little different method in the outer box construction. The round cooker was made from a candy pail on the same principle.

America Must Have More Watchmakers, Jewelers and Engravers

W. Calver Moore, Editor of "The Keystone."

HOW would you like to be able to take your pick of four thousand five hundred positions? To know that you could go to any part of the country and make a salary of $2,600 per annum? To obtain employment in pleasant surroundings, coming into contact with the best class of people, and having an opportunity to work into a splendid business? That is the enviable situation of the young man who learns the art of watchmaking, and almost equal opportunities also await the jewelry maker and the engraver.

The great demand for men who can make a watch keep time, mend broken jewelry, place precious stones in new and fashionable settings, or engrave a monogram on a piece of silverware, has been caused by the stupendous growth of the American love for the wares of the jeweler. There is no country in the world where the standard of living is as high as it is in the United States, for a man here thinks nothing of wearing a watch and ring worth as much as the entire earthly possessions of a European in the same relative position in life. During the last fiscal year of the Internal Revenue Department we spent over five hundred million dollars for watches, jewelry, diamonds, silverware and other articles sold by the jeweler.

The growth of the watch industry has been phenomenal. Men still living can remember when a watch salesman who said his factory could turn out seven complete watches per day had difficulty in convincing his friends that he was not exaggerating. They did not believe it was possible to *sell* so many watches. The facilities of that factory have been so greatly increased by improved machinery that it now has a capacity of more than two thousand watches per day, and there are other watch factories whose combined daily output runs up into thousands of complete pocket timepieces, without counting the ones engaged in the manufacture of clocks, ship chronometers and other time-recording devices.

Inasmuch as the accuracy of watches and clocks depends on the condition and adjustment of minute and delicate parts, the regulation and repair of these articles has become an industry of no small magnitude, but it has not been able to hold its own against the rapid automatic machinery of the watch factories.

The actual manufacture of watches has become almost wholly a factory proposition. Our watch factories employ hundreds of men who are expert assemblers and adjustors. The parts are made by machinery which is accurate to thousandths of an inch, and then collated into little boxes. A man receives a number of these boxes, each containing all but a few of the separate parts of a watch movement, which it is his duty to assemble. The movements thus produced are next passed to an adjustment and inspection department, which inserts the remaining parts and gives the final adjustment that makes them commercially accurate and therefore ready for sale.

After the thousands of watches thus manufactured find their way into the pockets of their ultimate owners, begins the trouble that has caused the present great demand for watchmakers. A watch is a delicately constituted and carefully adjusted machine that can suffer many injuries through neglect, carelessness and accident. A small particle of dust that would not embarrass a typewriter or a sewing machine will put a watch out of commission. Its parts may be broken, bent or thrown out of adjustment by the jar received when its wearer runs, stumbles, jumps off a car, drops it or lays it down roughly.

The trials and tribulations of the wrist watch are particularly heart-rending. People who wear them will persist in driving nails, banging away at demountable rims, swatting golf balls and scrubbing floors, according to the sex and condition in life, and there are also many careless little movements that may jar them disastrously. So the jeweler is besieged by an army of watch wearers seeking repairs and adjustments and this has given rise to the great demand for watchmakers to do this work in jewelry stores and the shops of the trade watch repairer.

The World War has been partly responsible for the present scarcity of watchmakers and the greatly increased demand for their services. First it took many of these men into military service, some as soldiers and others to make and repair scientific instruments. To others the change in industrial conditions brought new kinds of employment. In addition to this process of shifting men about, the war caused a tremendous demand for wrist watches, and later on, as these were laid aside with the return of peace, another and almost equally great demand for pocket timepieces.

Altogether, affairs have reached a stage where this country needs between four thousand five hundred and five thousand more watchmakers. These figures are based on the requirements of jewelry stores and do not take the factories into consideration. As far as the factories are concerned, it has been more than a year since they have been unable to keep up with the demand for good American made watches.

So acute has the repair situation become that it takes from five to eight weeks to get a watch repaired in any of the large cities. Jewelry stores in all parts of the

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country have racks full of waiting repair jobs and throngs of impatient customers. There are a number of men known as trade watch repairers who operate shops for the sole purpose of handling this class of work for the jewelry trade, but even these specialists, who do not lose any time waiting on customers, as the jeweler must, are wholly unable to find men enough to take care of all the work that is sent them.

Many attempts have been made to meet the scarcity of watchmakers by training a new supply of men. Watchmaking schools have been established by jewelers' associations in various parts of the country, and there are also a number of technical schools and universities which give courses in horology, as well as jewelry repair work and engraving. The ancient apprentice system can no longer be depended on to furnish recruits. Neither is it practicable for a young man to try to learn watchmaking by taking a position to "help around" a jewelry store, as his time is taken up too much by odd jobs, and when he is not occupied with such duties he finds the watchmaker is too busy to teach him anything.

During the war the Government found itself severely handicapped by the scarcity of watchmakers and scientific instrument makers who could construct or repair range finders, listening devices for submarines and airplanes, ship chronometers and similar complicated and delicate instruments. Some of the proprietors of horological schools were induced to establish classes, literally over night, to train men for these duties and the situation was relieved somewhat by this plan. However, if we were to be drawn into a large war again the problem would be a serious one. For this reason the Federal Government has begun to take an interest in the subject and thru the Board of Vocational Education has arranged for some of the discharged service men to take up watchmaking as a profession. An investigation of conditions is also being made by Carl W. Mittman, assistant curator of the Smithsonian Institution at Washington, D. C., contemplating the establishment of a National Association of Watchmakers under the auspices of the Smithsonian Institution.

The horological schools of the country at present have a combined total capacity of only a few hundred finished watchmakers per annum. They can graduate only a little more than one man per day, and for every one of these new men graduated by the schools, the watch and clock factories can turn out several thousand new timepieces. Consequently, these schools are "fifteen years behind their orders," or, in other words, it would take them fifteen years to train as many watchmakers as are needed right now, without allowing for any increase in the number of watches and the demand for their repair and adjustment.

During a recent interview with the principal of a technical school where courses are given in watchmaking, jewelry making and engraving, he stated that his school receives an average of 108 applications from jewelers for every student it is able to graduate. He exhibited letters from the finest jewelry stores throughout the United States pleading for men and setting forth the special inducements each was anxious to offer. This visit was made by the writer in connection with a wide investigation of the subject in order to determine the exact status of present conditions and learn what opportunities this class of work offers to young men.

It may be said that this field of employment has many very attractive features, including the demand for men and surety of steady work, the wages paid, the conditions surrounding the work and the business opportunities to which it leads. Compared with many other kinds of work and even with the "learned" professions it has many advantages.

The scarcity of men and the demand for their services are national. A competent watchmaker can find immediate employment in any part of the country. If he wants to work in a jewelry store he is able to obtain a situation in almost any large town or city, in a large store or a small store, north, south, east or west, according to his taste. If he wants to work in a trade watch repair shop he will be welcomed with open arms. If he prefers to establish his own business he can do that also and requires no equipment except the tools he has acquired, at a cost of perhaps $350, while learning his profession.

Jewelers advertising for watchmakers in the classified advertising pages of the jewelry trade magazines offer to pay salaries of $50 and over per week. Some stores also pay a bonus on merchandise sold, or in addition to the salary make a further division of the income from repairs with the man who makes them. This salary of $2,600 per year is more money than most men in mechanical lines are able to earn. Some artisans receive a larger salary per week when work is to be had, but their total yearly earnings are reduced by long periods of unemployment. The watchmaker never need be "out of work."

Work in a jewelry store is both pleasant and healthful. There is no discomfort from dust, no noise from whirring machinery, no unwholesome odor, no chance of injury from bursting fly wheels, no flying particles of metal. It does not entail danger of health through such causes as the lead which induces lead diabetes in paint mill workers, or the turpentine that causes painter's colic. The watchmaker's bench is of such a height that he sits up straight while working so his lungs are not crowded. Due to the accommodative powers of the eye muscles, the eyes become accustomed to the work with small parts and there is no more eye trouble among jewelers than there is among men in other lines. In short this is a profession which is free from any "occupational disease."

Watchmaking, jewelry repairing and engraving do not call for any great physical strength, as there is no necessity of being on the feet all day, handling heavy

articles or being exposed to the weather. Thus is opened a chance to earn a good living, and attain a useful position in life, for him who has had the misfortune to lose a leg in military service or by accident, or who is otherwise incapacitated for heavy or very active work.

Employment in a jewelry store perhaps offers the best openings from the standpoint of future business opportunities, because of the class of customers who patronize it. A jeweler and his employees come into contact with people who have money and believe in spending it. Watch repairing, the resetting of jewelry and its repair, and the engraving of silverware play an important part in the jewelry business. The majority of our successful jewelers of today started in as watchmakers and engravers, gradually taking on the sale of new watches, rings, diamonds, silverware and finally becoming jewelry merchants as the demand for this class of goods grew and grew and grew. What these men have done can be done by others in the same way. The income from repair jobs provides a good living, while the merchandising part of the future store is building itself up.

The young man who decides to become a doctor, dentist or lawyer must finance himself through a four-year course at a university where tuition and living expenses are high. The average young man who attends the best class of horological school for a course in watchmaking can get thru in eighteen months; tuition rates are low and most of these schools are situated in towns where board may be secured at very reasonable rates. Jewelry repair or engraving courses require an average of six months. These are average. A student with previous mechanical experience or natural aptitude for work of the kind can get thru in less time. Instruction is so arranged as to allow for progress according to individual ability.

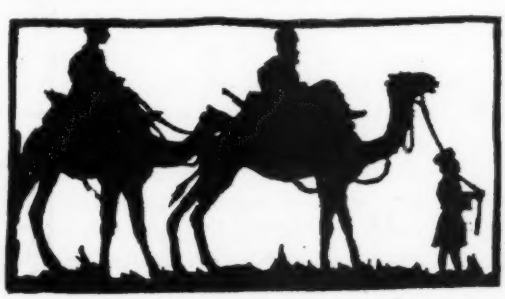
The jewelry artisan—if we may use that term to designate the graduate of any of the three courses referred to—finds work waiting for him and has the tools needed to perform it. He neither has to invest several thousands of dollars in scientific instruments and office equipment like the doctor or dentist, nor join with them and the young lawyer in years of disheartening struggle to get established. The outlook for his future is equally as good as theirs. In ten years he will be just as able to afford the services of a lawyer, doctor or dentist as any one of them will be able to buy his diamonds.

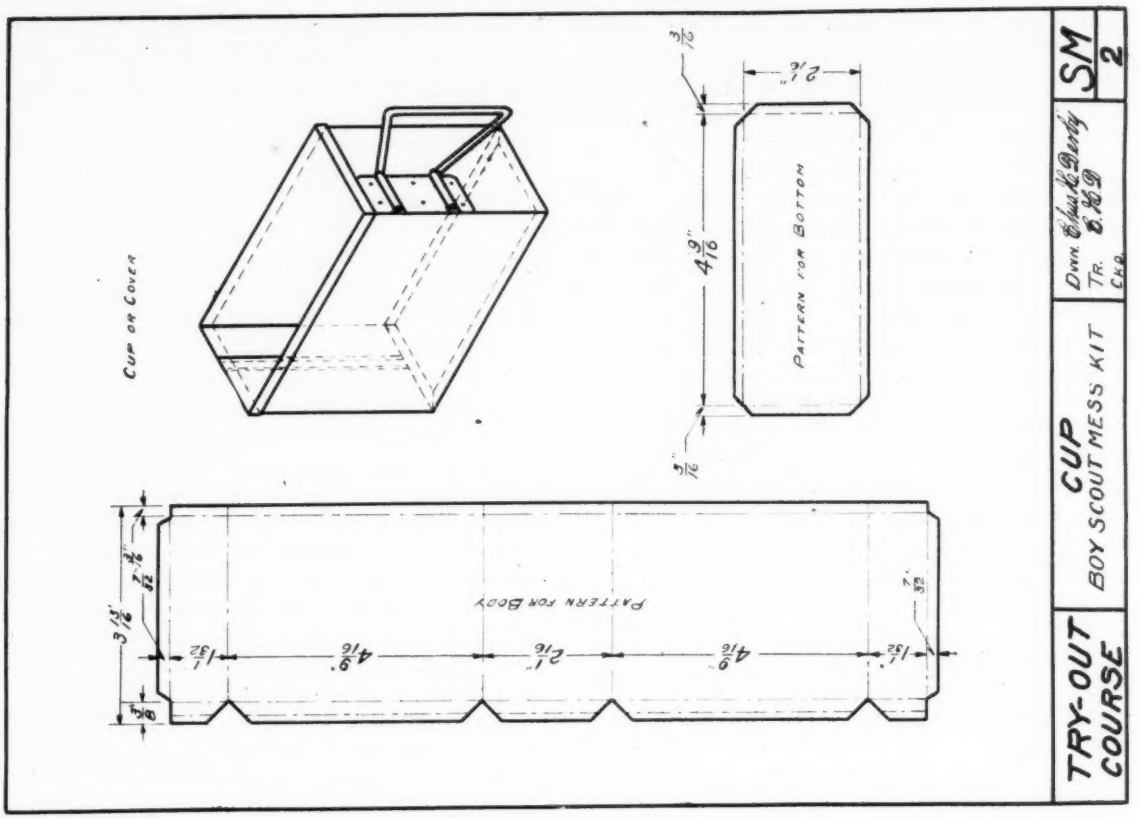
The science of horology as taught in the technical school, covers a wide range of scientific and mechanical subjects that are fascinating to the young man whose thoughts run along such lines. He learns not only to make and adjust all the parts of timekeeping mechanisms but also how to take time from the sun and stars and from wireless apparatus. Ancient means of time telling, such as the sun dial, the water clock and the sand glass are explained, and the profession has its literature, replete with the romance of Galileo's discovery of the principle of the pendulum and many other interesting incidents.

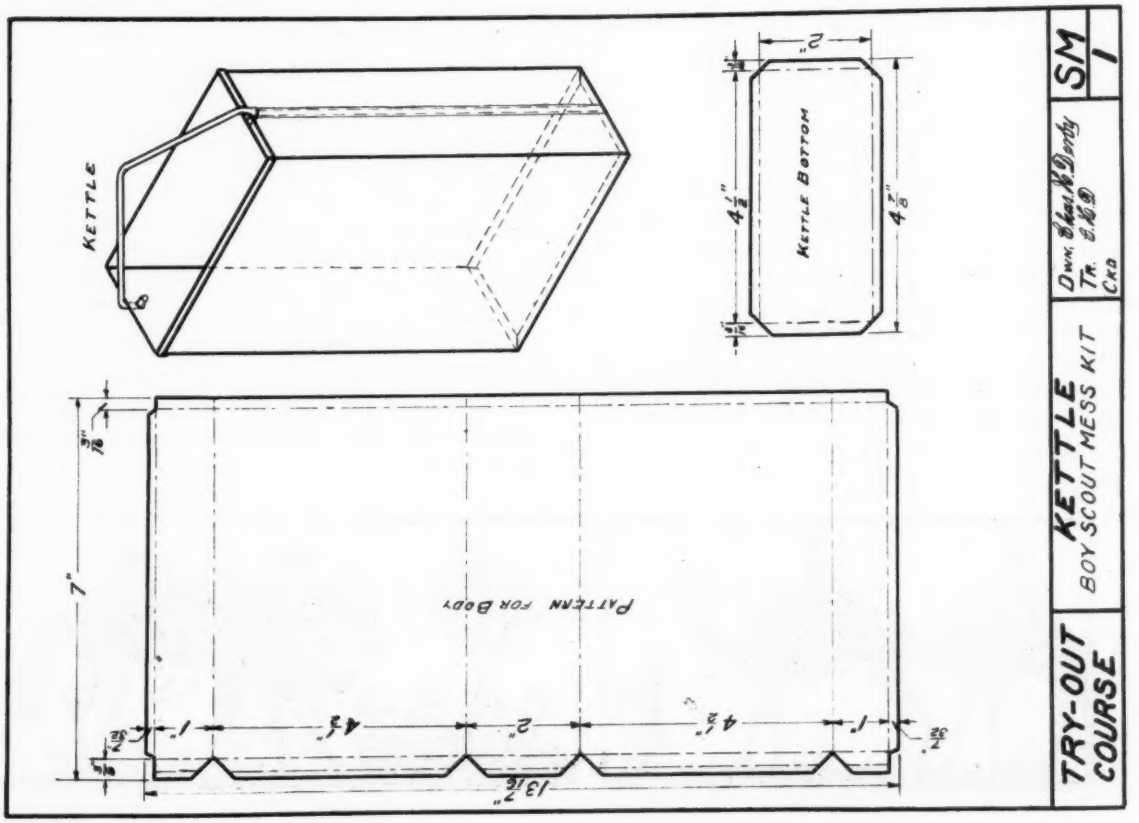
The educational equipment of the average high school student is sufficient to enable him to become a jewelry artisan, via the technical school. Thoro training of this kind means a more rapid rise to full earning capacity than attempting to learn at the bench, both because of the unsatisfactory conditions already mentioned, and because the well equipped school has better facilities and gives a more comprehensive grounding in the most advanced features than the busy jeweler can attempt to impart. There is no advantage from the standpoint of "practical work instead of theory" because the school gives both and the shop can provide only one. Students not only learn the science, but are taught to practice it, by actually performing every operation.

It will pay the young man who is undecided about his life work to give careful consideration to the profession of watchmaking, jewelry making or engraving. Graduating from high school at the age of 18, he can easily learn this profession and be making a splendid salary before he is 21.

There does not appear to be any likelihood of this field becoming overcrowded, as the schools cannot graduate ten per cent of the men required. Even if educational facilities are increased, as it is hoped they will be, the number of watches in the country is still growing by thousands per day and the advancement from watchmaker to merchant will continue to deplete the ranks of jewelry artisans and make openings in plenty for new men as fast as they can be trained. Even as this article is written, one of the big watch case companies is scouring the country in an effort to add thirty engravers to its force.




CUP OR COVER
PATTERN FOR BOTTOM
PATTERN FOR BODY
TRY-OUT COURSE
CUP
BOY SCOUT MESS KIT
SM 2


KETTLE
KETTLE BOTTOM
PATTERN FOR BODY
TRY-OUT COURSE
KETTLE
BOY SCOUT MESS KIT
SM 1

Junior High School Projects in Sheetmetal Work

Charles H. Derby, Instructor in Sheetmetal Work, Erie, Pa.

ONE of the most difficult problems confronting the teacher of sheetmetal work in the junior high school is to devise projects which will be interesting to the boy and at the same time include the fundamental experiences necessary in try-out courses. Many projects can be devised to give the experience in fundamental tool processes, but few can be selected that are elementary enough for the beginner.

In the search for projects of the right degree of difficulty, my attention was called to the Boy Scout mess kit. My son, a boy scout, desired to make a mess kit for his own use, and in making it suggested to me the feasibility of using it as a prevocational project.

The boy scout mess kit consists of a kettle and a cup which slide together, forming a container for the grate and the frying pan. Detachable handles are furnished for the frying pan and the cup and are carried inside the kettle. The first problem was to devise some means of making by hand those parts of the kit which in the commercial article were made by press work. An analysis of the processes required discloses that the following tools and machines were brought into use in making the kit by hand: Scratch awl, prick punch, squaring shears, hand snip, hammer, punch, rivet set, pliers, mallet, soldering copper, vise, grooving machine folder, wiring machine, wire cutters, square head stake, creasing stake, rule, file, cornice brake, and oxy-acetylene welding machine. The principles and operations involved will be explained in connection with the making of the different pieces of the kit.

In approaching the making of each separate article, the question is asked, What is the best material of which to make this? The resulting discussion brings out the names of the metals used, their properties, and their suitability for different articles. For example, we decide to make the kettle and cup of tinplate or "sheet tin." A little talk on why sheet tin is better than sheet iron, how the plate is coated with the tin, how sheet tin is marked to indicate thickness, the regular sizes in which sheet tin may be bought, impresses these facts on the mind of the boy at a time when he is interested in sheet tin. The different members of the class are assigned reports on the properties and manufacture of the different metals, to be presented at an assigned date.

Each article of the kit is treated as a separate project and is made in the following order: Kettle, cup, cup handle, frying pan, frying pan handle, and grate.

In making the kettle, each member of the class is supplied with a blueprint (Figure SM1) and a sample of the kettle is placed before the class. Their attention is called first to the pictorial representation in the upper right corner. Then different members of the class are required to point out the lines on the development that correspond to indicated lines on the perspective and on the kettle itself. This discussion brings out the reason why some lines are dotted and some are solid, teaches the boys to read blueprints, to get accurate measurements, and to observe the steps in the development of the pattern. Allowance for hem, lock seam, and double seam are pointed out, and reasons given for the amount allowed. The notches are explained, with reasons why they have to be cut as shown.

Next, two or three boys are given a pattern and a sheet of IX bright tin with the problem of how to lay the pattern on the given sheet so as to get the largest possible number of parts. They then find the number of sheets needed for the class, and report back to the class showing the best way to cut the stock so as to provide for everybody.

The use of the squaring shears is then explained. Two boys are allowed to set the gauge to the width of the pattern. Two more cut the sheets into strips and two others set the gauge to length and square one end of each strip. Then each member of the class cuts his own piece. The pattern is then placed on the piece and each boy marks his points with a scratch awl and prick punch.

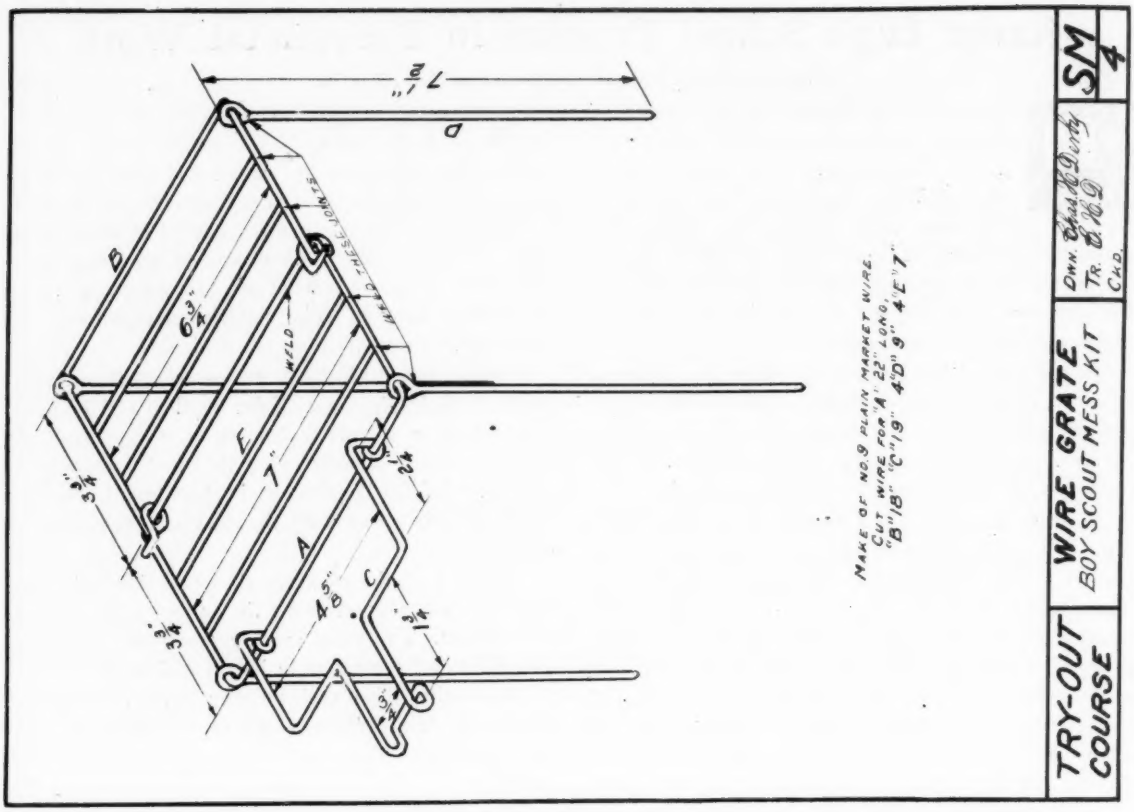
This is followed by a demonstration of the right use of the snips in cutting the notches without cutting beyond the lines. This demonstration is not complete until there is developed the idea of joining the ends with a lock seam, and grooving the seam to keep it from unlocking. Allowance of material to make the locked and grooved seam is figured.

In the same manner the idea of the hem is developed and an explanation made of how to form it.

Next, the folder is explained and demonstrated. The hem is turned thru the lock for the double seam, then for the locked and grooved seam. Next, we are ready for the brake which must be set so that it will not flatten the locks. After the brake has been used, we are ready to groove and roll the seam, so the principles and adjustments of the grooving machine are demonstrated.

The bottoms are then cut in the squaring shears, locked and placed into position. The square head stake is placed in a bench plate, the locks are squeezed together and double seamed with a mallet, the corners rounded with a hammer and the first step in construction completed.

Since this is to be used as a kettle, the question naturally arises, will this hold water? A trial soon convinces the boy that something further is needed. At this point, quite a little time is spent in finding what is known about solder, how it is made, what proportions of the different metals is used in making it, and how it is applied. Questions bring out the use of copper for a


TRY-OUT COURSE
WIRE GRATE
BOY SCOUT MESS KIT
DWN. Chas. H. Dorty
TR. C.H.D.
CK'D.
SM 4
MAKE OF NO. 9 PLAIN MARKET WIRE.
CUT WIRE FOR "A" 22" LONG,
"B" 18" "C" 19" "D" 9" "E" 7"
7"
A
B
C
D
E
WELD
7"
6 3/4"
3 3/4"
4 5/8"
2 1/4"
1 1/4"

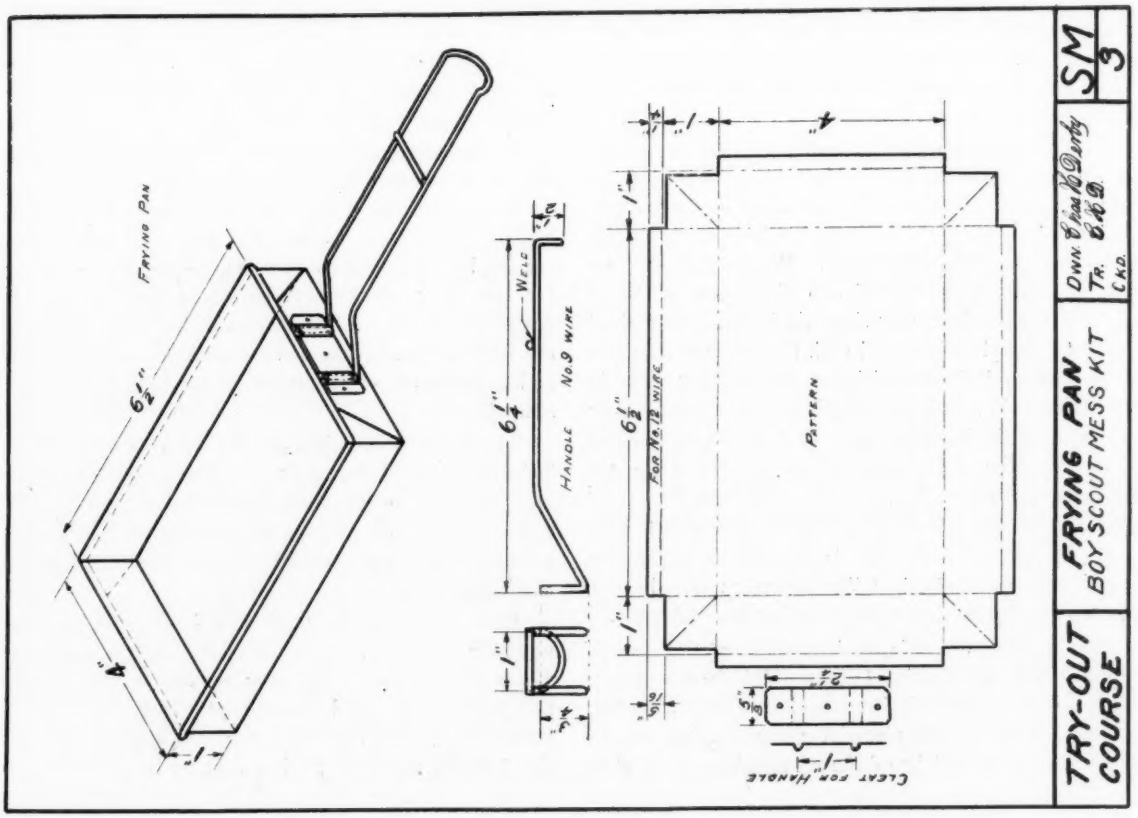

TRY-OUT COURSE
FRYING PAN
BOY SCOUT MESS KIT
DWN Chas. H. Dorty
TR. C.H.D.
CK'D.
SM 3
FRYING PAN
6 1/2"
4"
1"
HANDLE
No. 9 WIRE
WELD
6 1/4"
7/8"
FOR No. 12 WIRE
6 1/2"
PATTERN
2 1/2"
CLEAT FOR HANDLE

FIG. S. M. 6. THE COMPLETE KIT.

soldering "iron," how the iron is prepared for soldering, the use of flux, and the selection of the proper flux for soldering, the use of flux, and the selection of the proper flux for the metal used in the kettle.

As soldering is the most common operation in the sheetmetal trade, and as an otherwise first-class job may be spoiled by poor soldering, too much attention cannot be given to the care and handling of the soldering copper. A little practice on some scraps of metal properly seamed up, will add immensely to the boy's skill in the use of this process.

Holes are punched at the edge of the kettle, and a number 12 wire, cut 7½″ in length and formed as shown in the drawing, is attached as a handle. This gives opportunity to explain the Wire-gauge and how it is used and to bring out the different kinds of wire that may be purchased for use.

In the making of the cup, substantially the same processes are followed, since the cup is essentially the same as the kettle with the exception of the handle. The handle of the cup is held in place by a clip or cleat of tin, riveted to the side of the cup as shown in Fig. SM2.

First the cleat is cut to the given dimensions. Next, creases are made to fit number 9 wire, and the clip is riveted in place on the cup. A piece of number 9 wire, 7½″ long, is bent as follows: Bend ends inward to a

FIG. S. M. 7. THE KIT IN USE.

little more than right angles at 2¼″ from each end, so that the free ends of the wire are about ½″ apart. Then hold the last inch of the free ends firmly in the vise and bend the handle over at right angles making the form shown in Fig. SM2. It will be necessary to adjust the ends with the pliers until they exactly fit the cleat on the side of the cup.

In the making of the frying pan the square pan corner is explained and the merits of the square pan corner over the double seamed and soldered corner for

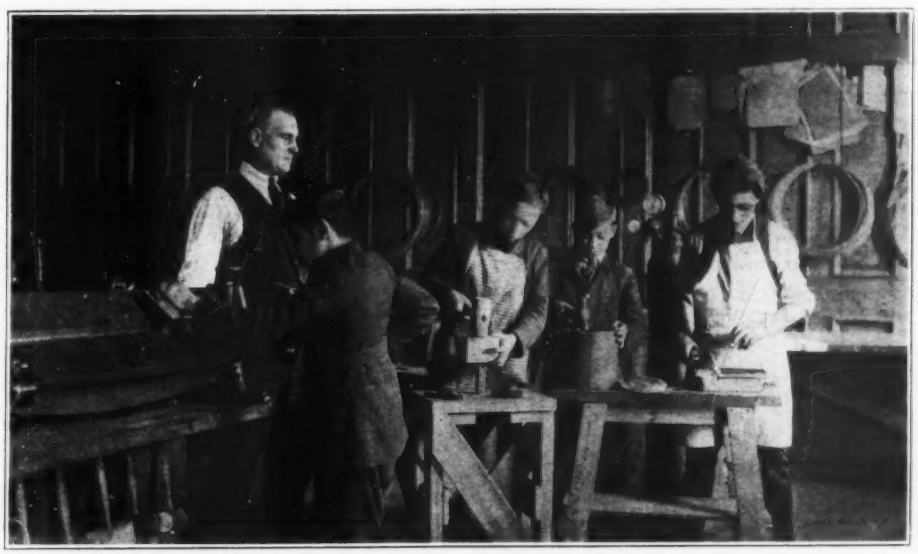
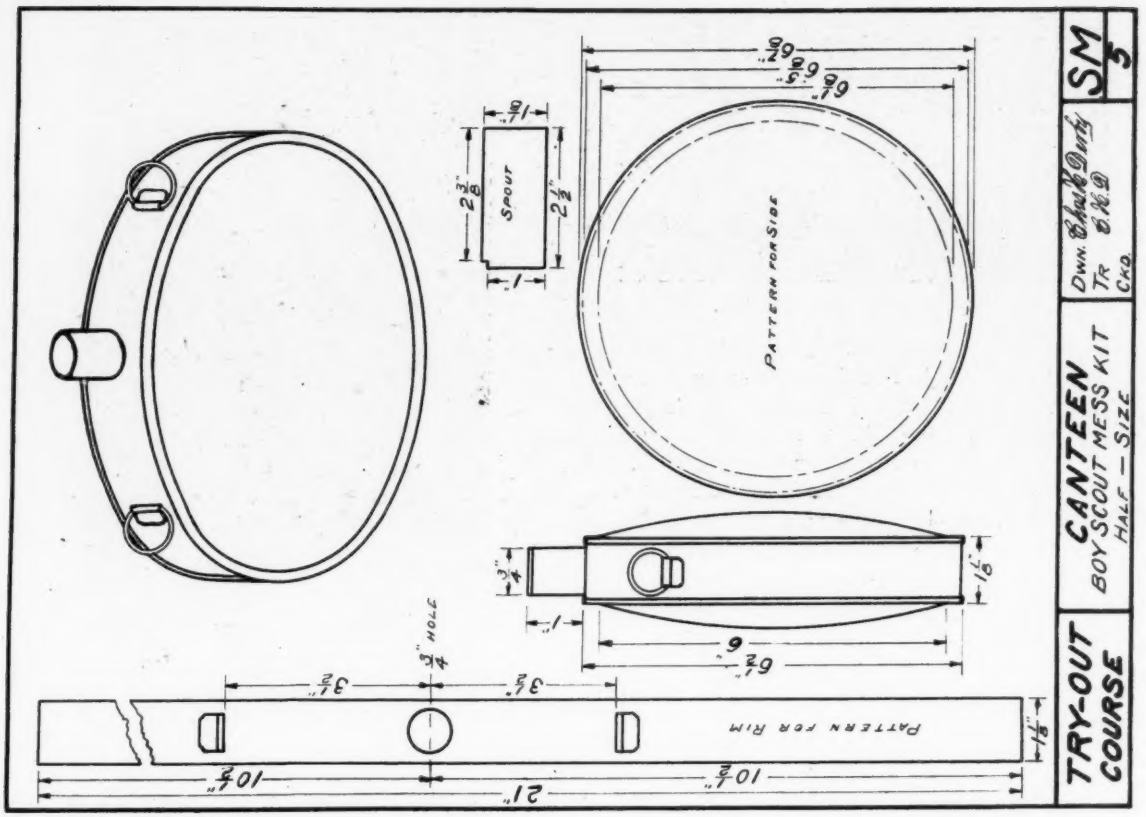


FIG. S. M. 8. PORTION OF A CLASS AT WORK.



frying pans are discussed. The allowance for wiring the edges must be worked out, the decimal diameter of the wire being taken from the side of the wire-gauge opposite the number of the wire.

Demonstrations are made on how to form edges, how to turn for wiring, how to measure and bend wire to form and how to cover the wire.

A clip, similar to that on the cup, is riveted in place and the handle made of number 9 wire bent as shown in Figure SM3, with a bar welded across the top so as to allow of an extension handle of green wood to be used when the frying pan is used in cooking.

Here the oxy-acetylene welding process is introduced. The gases used are explained, the pressure at the tanks, the safety-first precautions to be used, the proper mixture of gases and the manner in which the torch should be handled. This is not so difficult to impart to junior-high-school boys as it may seem. In the course of our two years' experience with this apparatus we have had no serious trouble in teaching the elementary operations of the oxy-acetylene welding apparatus. Fig. SM8.

A blueprint of the grate is furnished to each pupil. Fig. SM4. Wires are cut and formed as specified. In reading the blueprint of the grate, attention is given as to whether the measurements should be taken inside to inside or inside to outside. The welding is conducted under the direct supervision of the teacher or of a boy who has shown unusual aptitude in handling the torch. When the grate and frying pan handle are welded, the mess kit is complete.

In order to increase the scope of the try-out course, we have added to the mess kit a tin canteen, a very necessary object for field work. A blueprint of the canteen is furnished. (Fig. SM5.) The sides are marked out with the dividers and cut with the hand snips or circular shears. Great care is taken to demonstrate the process of raising the sides to the necessary curvature. After being raised, the sides are measured and the difference noted. This gives the amount that must be allowed for raising. About ½" around the edge is laid off flat by use of the turning machine. A burr is next turned at right angles on the edge. The rim is cut to the length indicated, a ¾" hole punched in the middle and the rim formed on the forming rolls. It is next placed inside the burr on the side piece and expanded until it fills the burr. The lapped ends are then soldered. Finally, both sides are placed in position and soldered neatly to the rim.

The spout is made of a single piece of tin and soldered in place. The rings for the sling are formed in the shape of a coil spring, cut off, and one side of the circle flattened. A clip is made as shown and soldered to the rim three inches on either side of the spout. The canteen is then tested to make sure that it is water-tight.

This completes the boy scout outfit. A picture of the completed kit is shown, Fig. SM6. How it looks in use by the original maker may be seen in Fig. SM7. The principles are taught in an interesting way and the result is something which every junior-high-school boy wants to have for his very own.

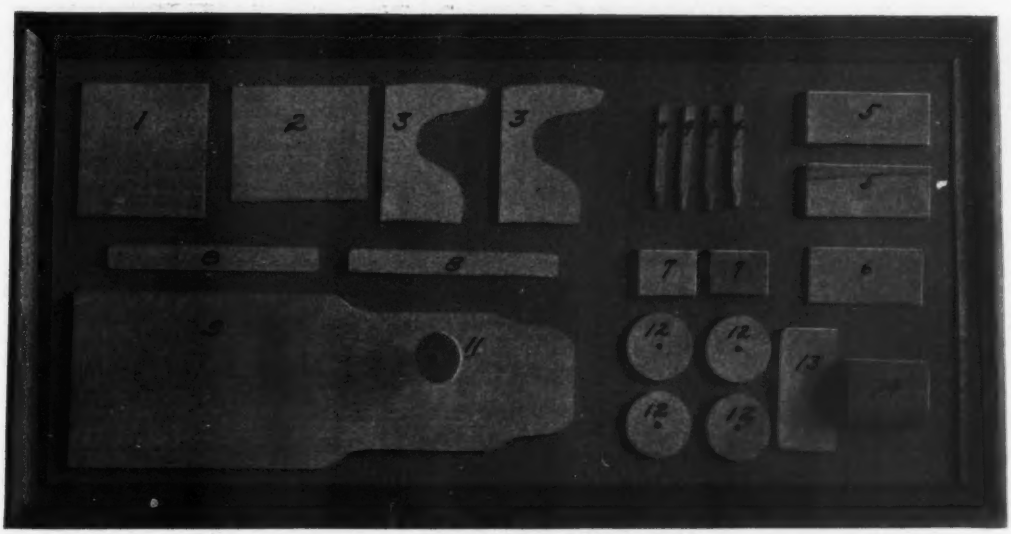


FIG. 1. PARTS OF TRUCK.

The Toy Truck as a Grade Woodwork Project

Fred L. Curran, Supervisor of Practice Teaching, Stout Institute, Menomonie, Wisconsin

THE toy truck when well designed furnishes an excellent project for boys from the sixth to the eighth grade. It has many elements of interest which may be utilized while developing the necessary skill and dexterity in the use of tools. The one here described is designed simple enough so boys will be able to make each part well. When completed it is much appreciated by every boy. It is made strong enough to withstand the ordinary rough usage which it is likely to get at the hands of a boy. All parts (except the steering wheel and post) are carefully nailed together with long enough brads and nails to insure strength. Most of the nails and brads should be driven at an angle which will add much to their holding power. The round-head screws used to fasten the wheels should be about two inches long and about 14-gage. Other details regarding construction and assembling should be worked out by the teacher beforehand and also developed with the class as the work proceeds.

While it is entirely satisfactory to have the toy truck made as an individual project it is here offered as a suitable group project or a production project.

Planning the Project.

Let us assume that we have two seventh grade classes with a total enrollment of thirty-five boys in both classes. Thirty-six trucks would be a good number to make in these two classes. When finished, each boy will have one of his own and there will be one for the teacher to retain as a sample.

Before starting the work we must see that plans are carefully made regarding the storage of stock and unfinished parts. In Fig. I are shown the parts needed to complete the truck. Fig. II shows a lumber stock rack. It will be well worth while for the teacher to plan the arrangement of stock and parts in the stock rack before starting the project. A simple and effective way is shown. The numbers on the parts shown in Fig. I correspond to the numbers on the stock rack. This means that as the lumber is cut from the boards for the several parts it is stored in the proper place in the rack according to name and number of part. The exact number of pieces should be cut and placed in the rack before beginning to make the truck. This number should be checked carefully in order to know whether pieces are spoiled in the making. The cost of each part should be

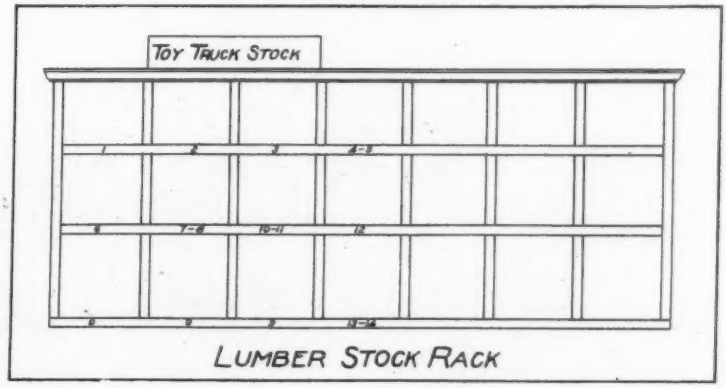


FIG. 2.

FIG. 3. THE "JOB" IN PROCESS.

carefully calculated by the boys as a part of the work of the class.

Making and Assembling.

After all preparations are made regarding stock and storage and the class is ready to start to make the parts the teacher will carefully organize each class into a working unit. He will appoint foremen over groups of boys and the foreman will be given the details of the particular job which his group is to execute. These details may be given in the form of drawings and specifications. The foreman is then held responsible for the work done by his men. He is to see that they understand just what is to be done and how it is to be done. An inspector may be appointed to inspect and test finished work, altho the foreman will need to do most of this work in order to be sure it is being done right from step to step. The teacher will assign the work to the several groups according to the abilities of the boys in the groups. The work should be assigned in such a way that assembling and painting can be begun very soon after the tool work is started.

Considerable time and emphasis must be given to the system of working in order that the boys will appreciate that part of it and in order that the work may run smoothly.

Fig. III shows a shop in which the toy trucks are being made. The parts are stacked on the benches where

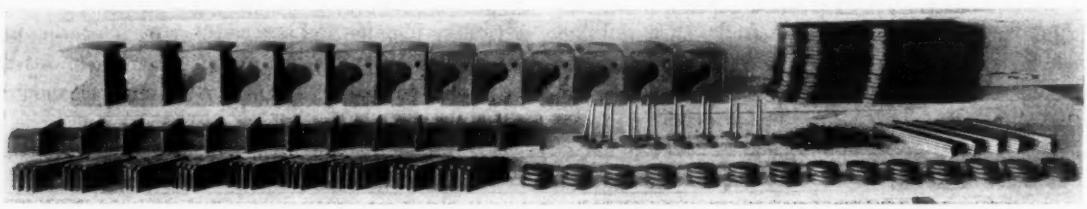


FIG. 4. READY FOR ASSEMBLY.

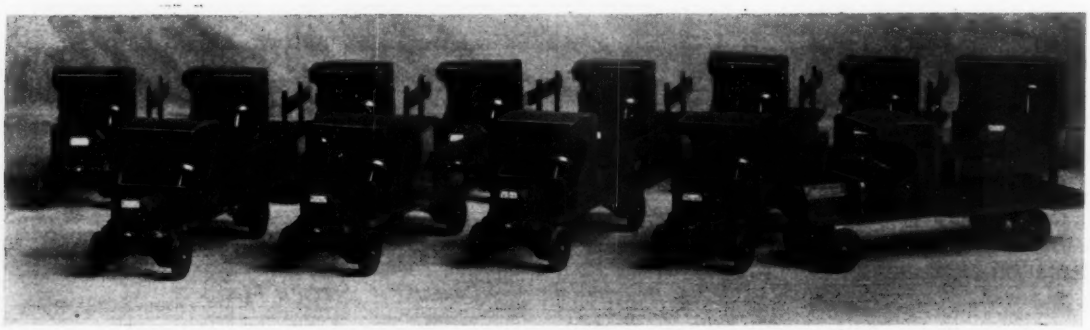


FIG. 5. THE FLEET OF TRUCKS READY FOR DELIVERY.

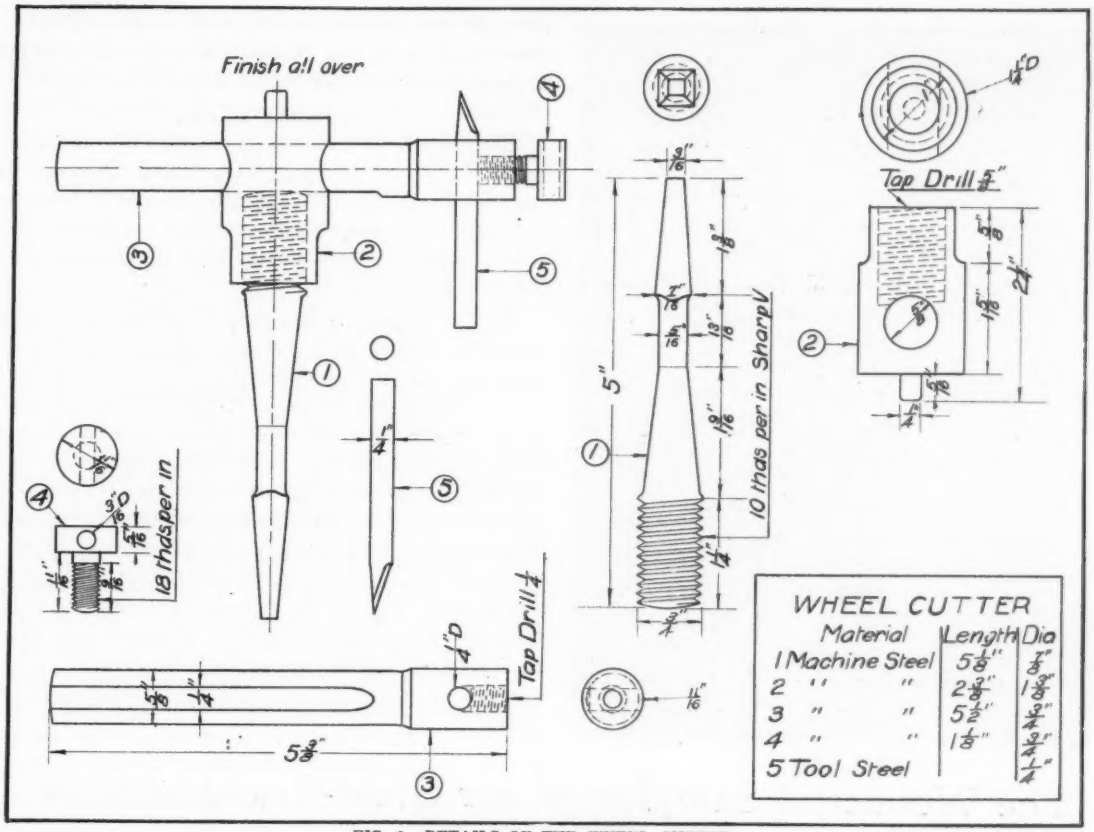

Finish all over
18 thds per in
10 thds per in Sharp V
Tap Drill 1/4
Tap Drill 5/8
WHEEL CUTTER
Material | Length | Dia
1 Machine Steel | 5 1/8" | 7/8"
2 " " | 2 3/8" | 1 3/8"
3 " " | 5 1/2" | 3/4"
4 " " | 1 5/8" | 3/4"
5 Tool Steel | | 1/4"

FIG. 6. DETAILS OF THE WHEEL CUTTER.

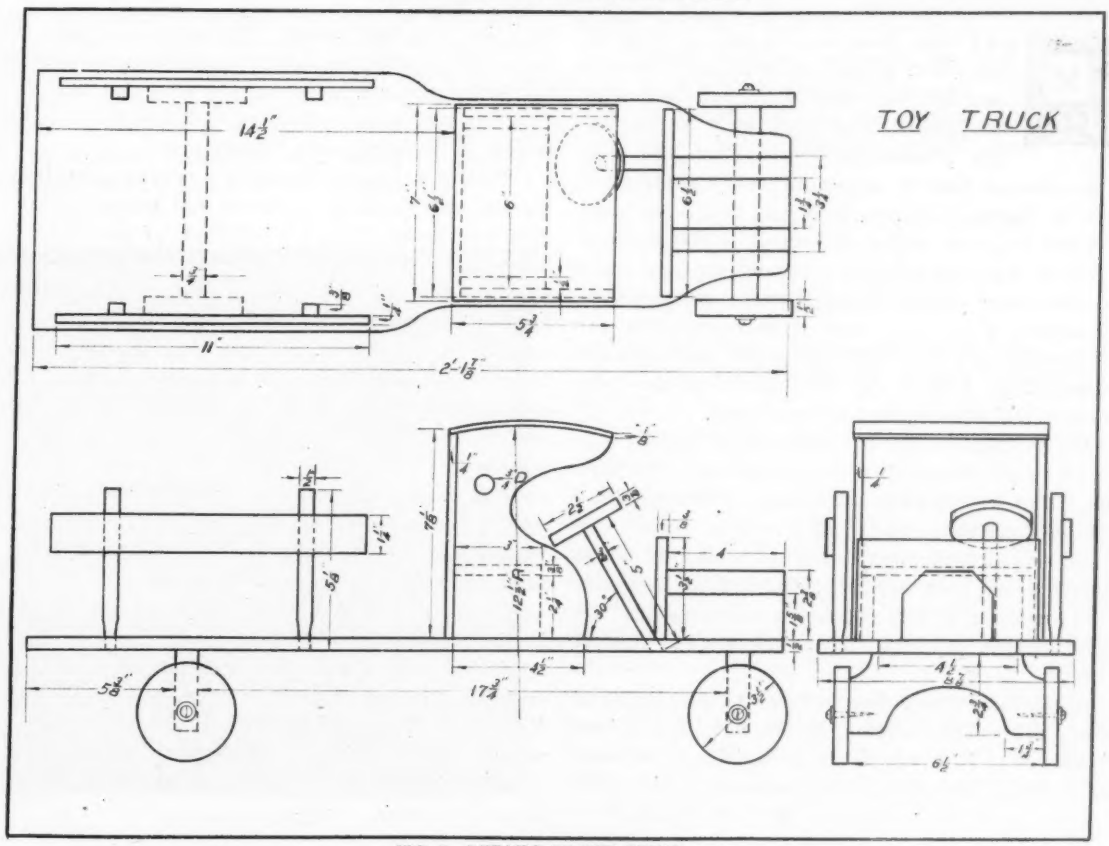


FIG. 7. DETAILS OF THE TRUCK.

the next operation is to take place. As a boy finishes a certain operation he passes the piece to the foreman or to the next crew as instructed by his foreman. At the close of each class period the finished and unfinished parts should be carefully stored in the rack and the number of pieces checked.

It is usually desirable for each boy to keep a time card showing what jobs he has worked on and the length of time on each.

Fig. IV shows parts painted ready for final assembly. Fig. V shows trucks assembled ready to be pulled away.

Use of Jigs.

In the production method naturally many jigs and other labor-saving devices will be used. There are three important reasons for using jigs in such a project. First, it enables the work to be done faster, and this encourages the boy; second, it helps in making the parts interchangeable; and third, it shows the boy the value of the use of jigs in factory work.

As the work is started the teacher will explain and demonstrate the use of jigs and show where jigs will be needed in making the truck. Then each foreman, with his group, will make such jigs as are necessary. Of course, the teacher will need to help with many suggestions regarding the construction of the jigs. When the jigs are once made they may be used by other classes altho there is a value that comes in the making of the jig that should be kept in mind by the teacher.

Cutting Wheels.

The wheels are made with a wheel cutter used in an ordinary bit brace. In Fig. VI is shown the details of this tool. It is not on the market but can be made in any machine shop at a small cost. The use of this wheel cutter makes it possible for the boys to cut wheels true and in a short time.

In the making of this project soft woods such as bass, pine, whitewood, butternut, or poplar can be used, and since it is to be painted more than one kind may be used in the same truck. A good quality of paint such as wagon and implement paint should be used. This gives the truck a finish that is attractive and durable. In having boys in industrial-arts classes make toys of any kind the teacher should hold a high standard of design and workmanship. He should aim to have toys made that are better than most toys that are on the market. The toy truck makes a strong appeal to boys and if well made should be beneficial both from the standpoint of the educational development of the boy and in the holding of his interests in good construction work.

The Wonderful Samplers of our Great-Grandmothers

Kitty Parsons, Brookline, Mass.

MANY long years ago, it was the duty of every well-brought-up little girl to work a sampler; but those days have long since disappeared, and I am sorry to say that this praiseworthy custom has gone with them. It is no longer a part of the child's education to learn to become dexterous with her needle—in most cases this is a mere matter of chance. In the old days, little girls, big girls, and even grown women spent much time with their needlework, and some of the specimens of samplers which have come down to us from our ancestors are truly wonderful examples of their exquisite workmanship. I think they must have had more perseverance and patience than we have today.

The sampler as a piece of work had a two-fold mission; it taught the alphabet and the stitches at the same time. Boys as well as girls did some of this work and a few of them were actually made by grown men. One of the very earliest given records of a sampler is one wrought by the poet, Skelton, (1469-1529). He speaks of "the sampler to sowe on, the laces to embroide." I cannot imagine any man today sitting down to this sort of work.

A great many poets have referred to the sampler in verse. Sidney, Shakespeare, Milton and Herrick have all mentioned it, which shows us again how universal was its use in those times, when women as well as children had more time to give to the quieter pursuits of life than they have today. The earlier the date, the deeper the interest we find that needlework possessed for women, and also the better the work that they did. The very best samplers that we find were made in the middle of the seventeenth century.

The best way to tell the age of a sampler is by studying the ones whose age is known and comparing them with the others. The style and form of the letters of the alphabet which appears on most samplers is one way of telling the age. The verse is another. The earliest samplers had neither alphabet nor numerals and they are far more irregular in form than the later ones. These were made rather as a sample of work and stitches which could be used as a copy, than the later ones were. Most of the samplers worked during the past two hundred years are dated, so there is little difficulty in placing the exact age. During the eighteenth century, animals, flowers and people were sometimes worked into these samplers and some of them are remarkable looking in shape and features.

Great examples of diligence are shown now and then in the appearance of whole chapters from the Bible, neatly embroidered for others to read. The 37th chapter of Ezekiel was worked on a sampler by Margaret Knowles in 1738, and in 1737, Elizabeth Greensmith wrought the 134th Psalm. More recent workers do not appear to be quite so ambitious and quotations are considerably shorter.

The work of some of the old samplers is so truly exquisite that it is believed that few of them were the work of very little children. There are one or two remarkable examples of the work of children of 6 and 7 years, but the majority of them are the work of older children, and sometimes of women.

Some of the verses we find are very amusing. One which was found on an American sampler is this:

"Mary Jackson is my name
America my nation,
Boston is my dwelling place,
And Christ is my salvation."

The square sampler in the picture has this verse:

"Seize the kind promise while it waits,
And march to Sion's heavenly gates,
Believe and take the promised rest,
Obey and be forever blest."

This was worked by Catherine Walton, born 1784. The other says:

"Youth if set right at first with ease go on,
And each new task is with new pleasure done,
But if neglected till they grow in years
And each fond Mother her dear Darling spares,
Error becomes habitual and you'll find
Its hard labour to reform the mind."

This was worked by Joan Ayer, born 1790. The same verse, slightly different in wording, is found on a beautifully worked sampler, wrought by Ann Maria Wiggins, aged 7 years, some time during the nineteenth century. It has a goldfinch embroidered at the top and the entire verse is surrounded by a mass of embroidered flowers. It was one of the most elaborate samplers in the Bond Street Exhibition, and one of the most remarkable known examples of a child's work.

A SMALL SAMPLER.

A LARGE SAMPLER.

Another verse found on an American sampler, worked by Martha Barton in 1825 is:

"When wealth to virtuous hands is given,
It blesses like the dews of heaven
Like heaven it hears the orphans cries
And wipes the tears from widows eyes."

On Martha Hooten's sampler in 1827, is written:

"I love the man who scorns to bend,
Beneath affliction's blast,
Who trusts in an Almighty friend
For his reward at last."

There are many other old specimens, some funny, some painfully serious, and all of them extremely interesting.

As an artistic piece of embroidery, the sampler is on the decline, for the few recent examples which are to be found, cannot compare in workmanship with those of an earlier period. This is a busy age in which we live and even a child today is not content to sit quietly stitching when she might be doing other things with a far stronger appeal. But it is very interesting to look among the old things that belonged to our great-grandmothers and see if we can't discover an example of their patience and diligence, even if we lack those same qualities or at least the desire to apply them in this way, for ourselves. Who knows but we may yet be inspired to take up this oldtime art again some day when there is a lull in the mad rush of events?

INDUSTRIAL-ARTS MAGAZINE

E. J. LAKE S. J. VAUGHN
Editors

EDITORIAL

SUCCESS.

WHERE is the self-made man who used to tell us thru the columns of our popular magazines just how he succeeded? We felt a little jealous of him, not because we thought him so superior as his confession indicated, but because we were convinced that in spite of his frugality, he had unusual opportunities that did not exist for us. Now we are not so jealous of him, for we suspect that his position is not so desirable after all. His frugality may have developed ability to avoid some of his income tax, but we are not subject to that exercise of frugality. We are learning slowly that his hard earned financial success was of a rather poor sort, unless he had some qualities that did not appear in his confession.

A peculiar reaction on the part of teachers to emphasis on their "pitiful condition of employment" is evident. We have lately heard teachers grow eloquent in resentment against the assertion that their profession was one of self-denial and abnegation. We join with them in the assertion that it is a profession second to none in opportunity for ambitious and honorable success.

OBEDIENCE TO LAW AND THE PART-TIME SCHOOL.

In the states where the compulsory part-time law goes into operation in September, 1921, many of the cities are finding themselves in difficult situations. Unless some sort of relief comes in the form of additional legislation with reference to the tax rate, this promising and important type of school work seems doomed to tremendous handicaps at the very outset.

Many school administrators are beginning ahead of time under the "optional mandatory" feature of the law, while others take a decidedly belligerent attitude and proclaim with some heat that they don't propose to try to do anything with the work even next year, in spite of the law, adding this very curious explanation, "since there is no penalty attached to the violation."

May we not raise the question as to whether this is not a rather low level on which to put obedience to law, especially when so placed by people who are supposed to teach our children that the fundamental compulsion of law is the moral obligation which it lays upon all good citizens?

There are abundant reasons why some cities will obey the law under great difficulties and why others by the very necessities of the case will be compelled to postpone the opening of the part-time schools. But no school man should ever give as his reason for failure to start the work the fact that no penalty attaches under the law to its infraction. And wherever it is at all possible, some sort of a start should be made in the hope that at least limited opportunities may be opened for those young workers who are so much in need of training, inspiration, and guidance.

THE VALUE OF BREVITY IN THE PART-TIME SCHOOL.

In an army hospital some soldiers were being given some work in bookkeeping and commercial forms. Their probable stay was limited to seven weeks, on the average. The teacher, who was a university graduate in accountancy, was asked what he was doing for the men. He replied, "I'm giving them the first seven weeks of the four-year course."

He had not caught the idea that in so brief a time what those men needed, if anything in his line, was some simple helps in the commonplace, everyday tasks of the corner groceryman, drayman, order man, timekeeper, watchman, clerk, etc.

The very shortness of the time of the part-time school is going to force teachers to eliminate a great mass of the verbiage and the nonessential matter in their work and to get right down to the heart of it at the very first meeting of their classes. The proposition of part-time classes still has to be *sold* to many boys and girls who are forced back to school. It cannot be made to appear as perfectly vital and indispensable, if it *is* put on the basis of the rather hazy, indefinite, "general" type of instruction often found in the regular school work. It must be a clear, definite message that appeals to the sense of values in working boys and girls.

This, of course, means a reorganization of the courses of work, a more direct method of instruction, and a treatment of the material in the spirit of determination that the brevity of time shall not deprive the pupils of the *essence* of what the teacher has to offer.

TWO GREAT MEETINGS.

On February 10, 11 and 12, in Minneapolis, the Vocational Association of the Middle West will hold what promises now to be one of the greatest vocational meetings ever held in this country. Concessions have been made by the railroads for a reduced fare. Arrangements have been made in the Twin Cities to care for the Association in royal fashion. One of their spokesmen assured us that they "would show us a hot time in a cold climate." And any reference to the climate always brings the comforting assurance that *"you never notice the cold up there."*

The preliminary programs are out and are being distributed. Extra copies may be hald by addressing Prof. E. A. Lee, University of Indiana, Bloomington; or L. A. Wahlstrom, 1711 Estes Avenue, Chicago.

Two weeks later, in Atlantic City, the National Society for Vocational Education will hold its annual meeting. The advance program has not yet appeared, but advance information assures the usual strong program that has always characterized this organization's

meetings. It seems almost a calamity for one to have to decide not to attend both these meetings. This is the year of reorganizations, new projects, new legislation, and new opportunity, and these meetings should clear the way for united and vigorous attack upon the various problems that confront the vocational people.

A GOOD RESOLUTION.

Perhaps the best resolution that could be made by those who talk and write about education would be one to confine themselves this year to perfectly definite, understandable, simple statements concerning practical, desirable, and attainable ends. Wherever education has been discussed, it has almost invariably fallen into a kind of pseudo-intellectual, "high brow" jargon that was as meaningless as it was useless.

The new emphasis in education is on the functional phases and values of it. There is a strong and growing feeling that the best way to train boys and girls for tomorrow's duties is to give them such vital work as functions at once in *today's* needs and desires. That is, the arithmetic, civics, and physiology that will best meet the demands of the immediate future are such phases of arithmetic, civics, and physiology as are significant in the daily lives and experiences of the pupils and as they see functioning in their intimate relations with the world and its work.

If one asks questions concerning education or desirable modifications of it for specific ends, one receives dissertations couched in the most general, all-inclusive terms which mean absolutely nothing that can be made use of. In an educational meeting, the desirableness of personality and its cultivation was being stressed. Someone asked, "What is personality?" The reply quoted a noted scholar to the effect that, "Personality is the sum total of all of the desirable human traits!" Pray, what good does any such an ingenious confession of ignorance do? What the enquirer wanted to know was how personality functions or manifests itself, what are its characteristics, whether it differs from character and how, and the simple elements of behavior that make up that desirable possession.

Let educationists resolve at least for this year to quit talking pedaguese and to get down to definite, one, two, three facts that are usable by the ordinary teachers in the ordinary schools. This will be a great year for education, if this advice is taken; but it will almost destroy teachers' conventions and general writings on pedagogy and education.

IDEAS UNDER A BUSHEL.

Some teachers have peculiar and unprofessional notions in keeping secret new ideas which they have developed in their shop and classwork. This seems to be especially the case with men who have come into the schools thru the industries and who have carried along with them worn out ideas of trade secrecy. They overlook apparently the fact that all progress in education has come from the interchange of ideas and experiences and the adaptation of new theories and methods to new situations. In this connection it is interesting to read what a writer in The Woodworker says:

For some reason or other the natural tendency is to "keep mum about trade kinks." When a worker, foreman or anyone else discovers an easier way to do something, he hastily looks around to see whether or not anybody saw him do it in the newer or better way. He thinks to himself, "This kink is too valuable to reveal to others; I'll keep it to myself and it may help me some time." He continues to do the work the old way, because the new way is his secret, and he fears somebody will steal his idea from him. The longer he keeps it the more valuable it seems to him; he never lets go of it, and perhaps lives to see some one else discover the same trick. The "other fellow" tells about it in the technical or trade papers, and forges rapidly to the front.

Ideas are valuable, true enough, but they are of no value whatever if they are not used. If an idea is good, is patentable and seems to be worth patenting, the thing to do is to take out a patent.

Many ideas that are good are not patentable. For example, in many plants time and energy are lost blowing dust and lint out of machines with hand fans. That is the way it always has been done, and for that reason the foremen think that is the way it must be done. A girl who had to do the work in one plant suggested, one hot day, that the foreman furnish her with an electric fan for doing the work. He "tumbled" and furnished the fan. It worked nicely, did the work better, more quickly and did not cause the girl to overexert herself. Many little improvements of this simple nature are possible in and around the plant.

A friend of mine explained it to me in this way not long ago. He said, "Let us trade dimes. You give me a dime for one of my dimes." We traded. Then he said, "We haven't progressed a bit. You are no richer than you were before." I agreed with him. "Now," he said, "let's trade ideas. You tell me how to rearrange my belting system to save power and I'll tell you how money can be saved on lubricants." I agreed, and we traded ideas. He then showed me that we were both richer in ideas.

The progressive man isn't afraid to tell what he knows or ask questions about what he doesn't know. He doesn't keep his light under a bushel.

DEVELOP LEADERS.

Your true democracy must have leaders; and the better the leaders, the better the democracy. These leaders must be men of the most gracious and sincere manners, the most cultivated imagination, the finest self-sacrifice, the highest ideals. Wherever we need leaders, we need just such men. And such men do not just grow. They must be developed and inspired somewhere.—*E. W. Parmalee.*

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

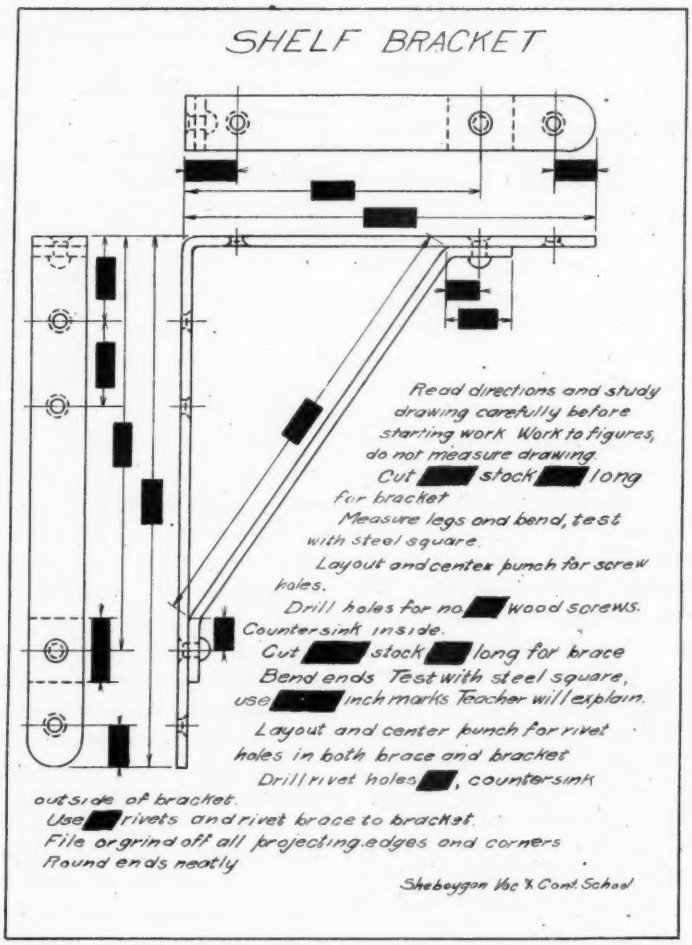
Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

A METHOD OF PRESENTING PROBLEMS.

J. G. Childs, Sheboygan, Wis.

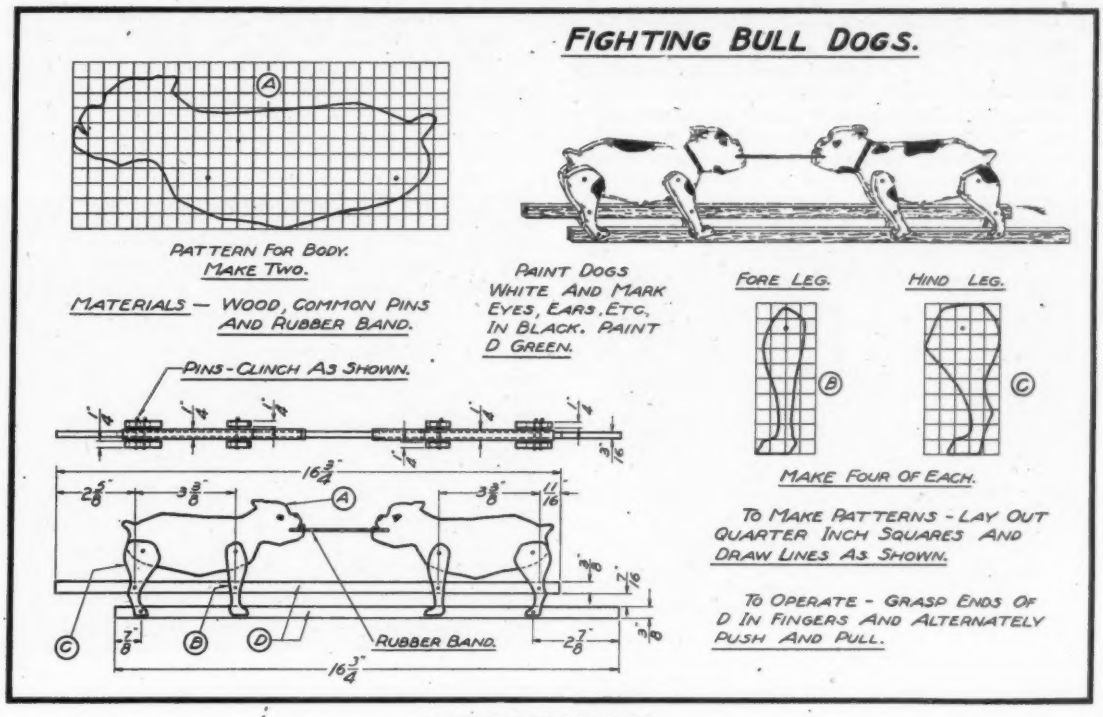
The accompanying drawing and lesson sheet are illustrative of a method of presenting problems in part-time vocational classes. Students in such classes range from fifth and sixth grades to high school students and are with the class only two or four hours a week. For the most part, they have no idea of the sequence of operations, or of proper methods of procedure. The personnel of the classes changes constantly and it is seldom that two students are ripe for the same problem at the same time. Under such conditions it will readily be seen that a class demonstration is of doubtful value. Teachers of classes of this type must organize their work and divide their time, in such a manner as to give the greatest amount of individual attention to each student.


SHELF BRACKET
Read directions and study drawing carefully before starting work. Work to figures, do not measure drawing.
Cut [redacted] stock [redacted] long for bracket.
Measure legs and bend, test with steel square.
Layout and center punch for screw holes.
Drill holes for no. [redacted] wood screws. Countersink inside.
Cut [redacted] stock [redacted] long for brace.
Bend ends. Test with steel square, use [redacted] inch marks. Teacher will explain.
Layout and center punch for rivet holes in both brace and bracket.
Drill rivet holes [redacted], countersink outside of bracket.
Use [redacted] rivets and rivet brace to bracket.
File or grind off all projecting edges and corners. Round ends neatly.
Sheboygan Voc. & Cont. School

TYPICAL JOB DRAWING PREPARED BY THE AUTHOR.

The use of job drawings and lessons is one practical solution of the difficulty. It is desirable that each job be divided into steps in the proper order and that definite instructions be given for each step. This eliminates repetitions and vague verbal instructions and gives the student a measure of training in the reading and understanding of drawings and written instructions. The teacher need not constantly answer non-essential questions, but can devote his attention to the students who need it most. Thus, students are not deprived of individual work, but are put on their mettle to ask for what help they actually need. The plan has the advantage of making it possible to give an entire job to a student, or to pass on each step separately as the student completes it. In either case, the boy receives such help as is necessary to start with, and the teacher is free to work elsewhere until the boy is ready for the next operation.

No claim is made to originality. The writer has floundered around in this work for a number of years and in that time has seen many others apparently as hopelessly mired. Most readers will recognize the application of sound and well tried lesson planning to suit the conditions peculiar to our work. The project was selected on account of its simplicity and only to illus-


FIGHTING BULL DOGS.
PATTERN FOR BODY. MAKE TWO.
MATERIALS — WOOD, COMMON PINS AND RUBBER BAND.
PAINT DOGS WHITE AND MARK EYES, EARS, ETC, IN BLACK. PAINT D GREEN.
FORE LEG.
HIND LEG.
MAKE FOUR OF EACH.
PINS - CLINCH AS SHOWN.
RUBBER BAND.
TO MAKE PATTERNS - LAY OUT QUARTER INCH SQUARES AND DRAW LINES AS SHOWN.
TO OPERATE - GRASP ENDS OF D IN FINGERS AND ALTERNATELY PUSH AND PULL.

DETAILS OF TOY DOGS.

trate the method. Many lesson sheets are but rough sketches, with instructions written in, and made as occasion demands, but when it is considered that the high points are brought out more clearly to both student and teacher, the preliminary work is always worth while. So far as possible every job is assigned in this way and there is usually cause for regret when this is not done.

SCOUT KNIFE SHARPENER.

Kenneth L. McCullough, Plainfield, N. J.

This sharpener was planned to meet the requirement of a local Scout Master. Because it calls for the use of a number of tools, it makes a good project for the beginning of the year.

Each side is covered with one-fourth of an 8½"x11" sheet of emery cloth, using one or two grades of coarseness. The corners of the handle are slightly rounded, also the ends of the dowel, which is used to protect the hand.

FIGHTING BULL DOGS.

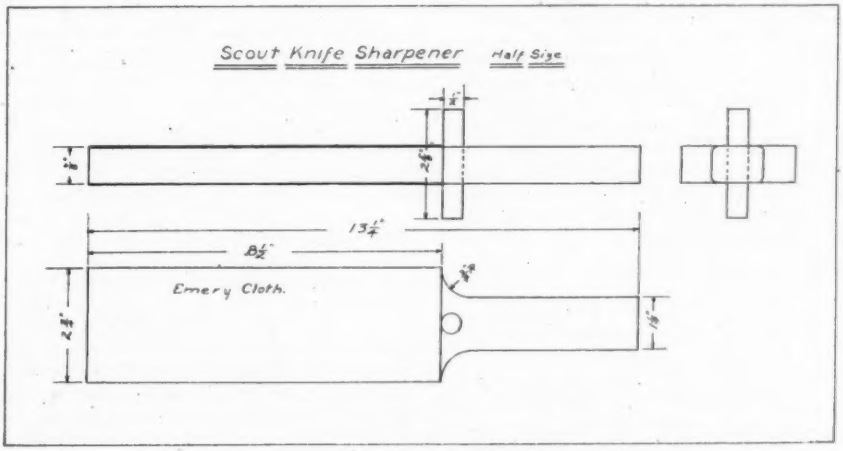
Frank I. Solar, Detroit, Mich.

The Fighting Bulls, as the boys named them, have been very popular in toy making classes and have been good sellers at our toy sales in Detroit.

As there are several parts to be made from each pattern, it is well to cut patterns from cardboard. The square method is used for laying out the patterns as shown on the drawing.

Use softwood for this toy and do the cutting with a jig or coping saw. Finish the edges with sandpaper. The required number of parts for the dogs are noted on the drawing.

The handles (Parts D) will have to be planed to size. These are the only parts that cannot be made from cigar box lumber. In Detroit we can buy bundles of clippings from the cigar factories. They are sold to the boys for kite sticks. Of course these long pieces are just the



DETAILS OF KNIFE SHARPENER.

thing for this toy, when planed a little thinner than the body of the dog.

Bore a hole for the rubber band in the mouth of each bull dog. Assemble the parts with pins, using a pair of round nose-cutting pliers to cut the points of the pins and turn the ends. Bore holes for the pins with a brad awl. If the one at hand is too large, make a small one by driving a brad in the end of a piece of stick and filing off the head.

Paint parts according to the scheme given on the drawing. The toy should be painted, after it has been tried out and before it is finally assembled. Show card water colors, covered with a quick-drying white varnish, will be found easy for boys to handle.

Study the drawing and notes carefully, before beginning the work, and do not make the usual mistake of fastening the feet of the front legs.

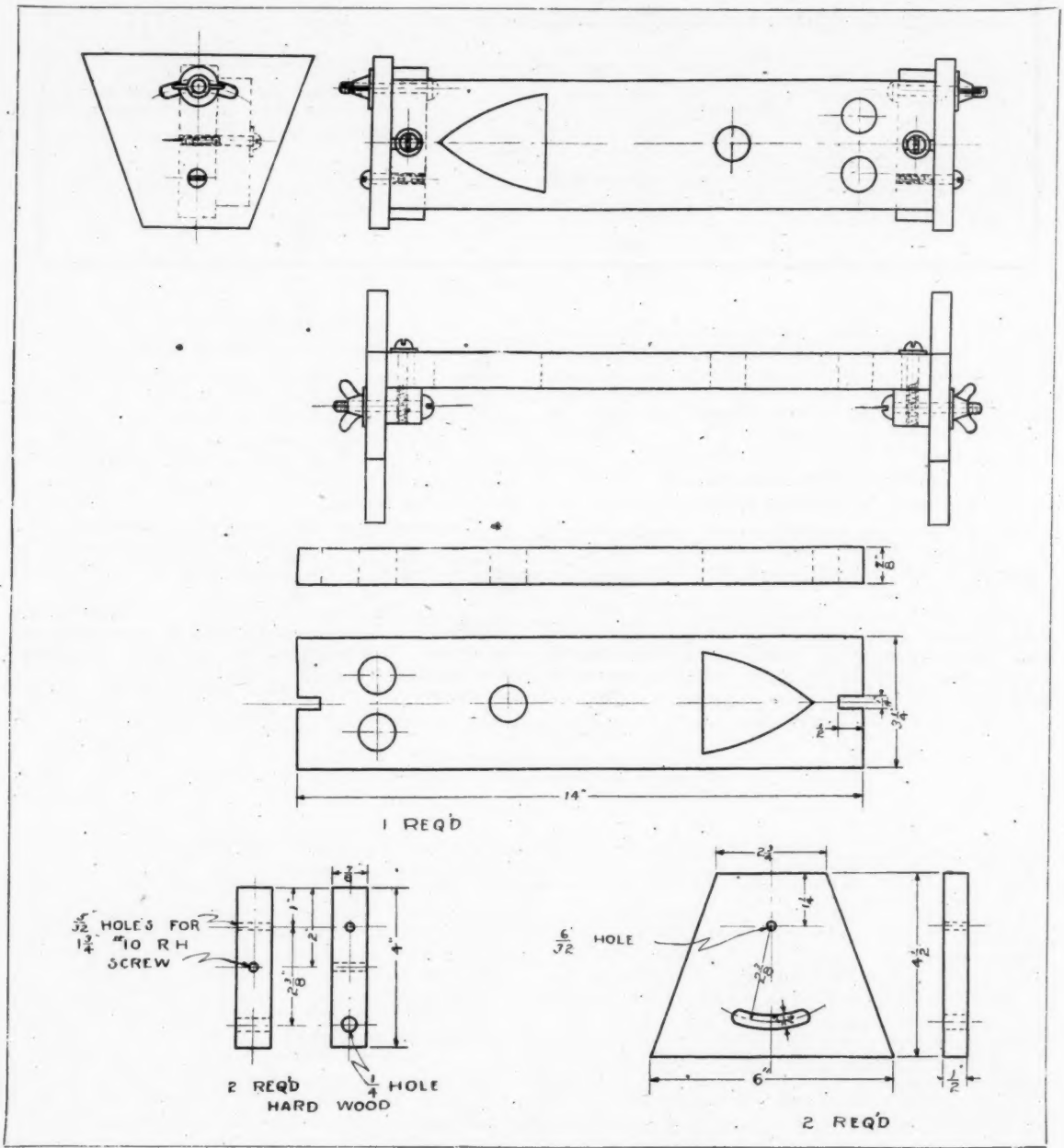
A JIG FOR SHARPENING SKATES.

Clyde D. Pierson, Central High School, Lima, O.

When the ice is good the boys are frequently asking for permission to sharpen skates in the school shop. The jig illustrated in the accompanying drawings was devised by the writer and his class for holding skates so that they can be hollow ground.

The board to which the skate is to be fastened is intended for use with clamp skates. No dimensions are given because the holes must be located to suit the skates to be ground. The various types and the extreme sizes of skates require slight variations in the boards. These are easily made and interchanged.

Place a board about three feet long horizontally before the emery wheel. Clamp the skate on the jig and adjust the angle so that the edge of the skate runner is tangent to the wheel. With a little care in making this adjustment a good job of hollow grinding can be done.



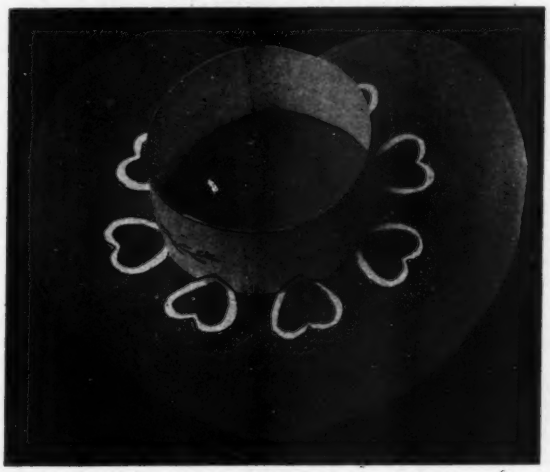
DETAILS OF JIG FOR SHARPENING SKATES.

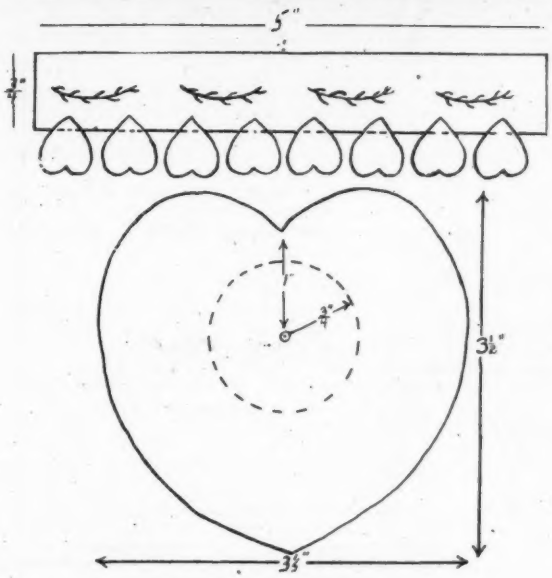
VALENTINE FAVOR CUP.

Grace Roberts, Des Moines, Ia.

Material: White drawing paper, watercolors and paste.

Draw heart (or cut on fold) from a 3½″ square, and paint vermilion, edging with narrow band of black. From indentation of heart, measure 1″ towards center, to find center of cirele; circle has radius of ¾″.





VALENTINE FAVOR CUP.

Draw band ¾″x5″. Cut pattern of small heart from ⅝″ square, and trace around it, drawing eight hearts on this band, in position shown. Paint these little hearts vermilion, leaving white margin around edge. Fill pen with vermilion, and draw design on white band. Edge band and hearts with black.

Bend hearts at right angles, on horizontal dotted lines; paste ends of band on vertical dotted line, to form cup; and placing this cup on dotted circle of heart, with seam at indentation, fasten to large heart by pasting the small ones in place.

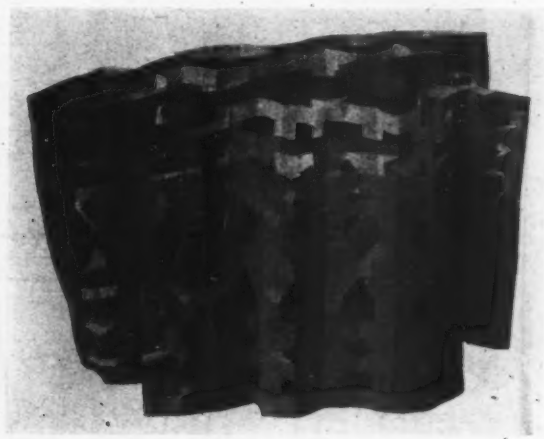
This is a very attractive favor, and not difficult to make. The great beauty of these trifles is the exactness with which they are made. So this is a problem offering practice in the application of a smooth wash, and demanding exactness of measurement—both of which are greatly desired in school work.

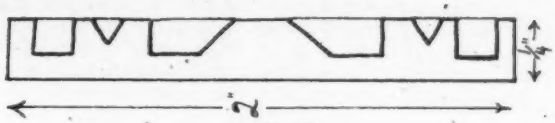
GARLAND.

Grace Roberts, Des Moines, Ia.

Material: If for patriotic purposes, use red, white and blue tissue papeer. Paste.

Cut tissue in oblongs 2″x4″. Fold two-inch edges together, then fold center formed to edges again, and continue until the width of the fold is about ¼″ wide. Cut design shown (or any other suitable design) on the center fold. Unfold, and lay red oblong on white, blue on another white, pasting the two-inch edges of each pair together; when all the papers have been pasted in pairs, attach the pairs to each other by pasting center of white to center of blue, the center of the next white to center of following red, so as to have this color order: Red—white—blue—white—red—white—blue, etc. Repeat to the desired length.





GARLAND.

As this is a very simple garland, it can be made by even the little children, as well as being a joy to the older ones. It is very attractive when pulled out and hung in place.

A THREE-LEGGED MILKING STOOL.

Robert H. Smith, State School of Agriculture, St. Lawrence University, Canton, New York.

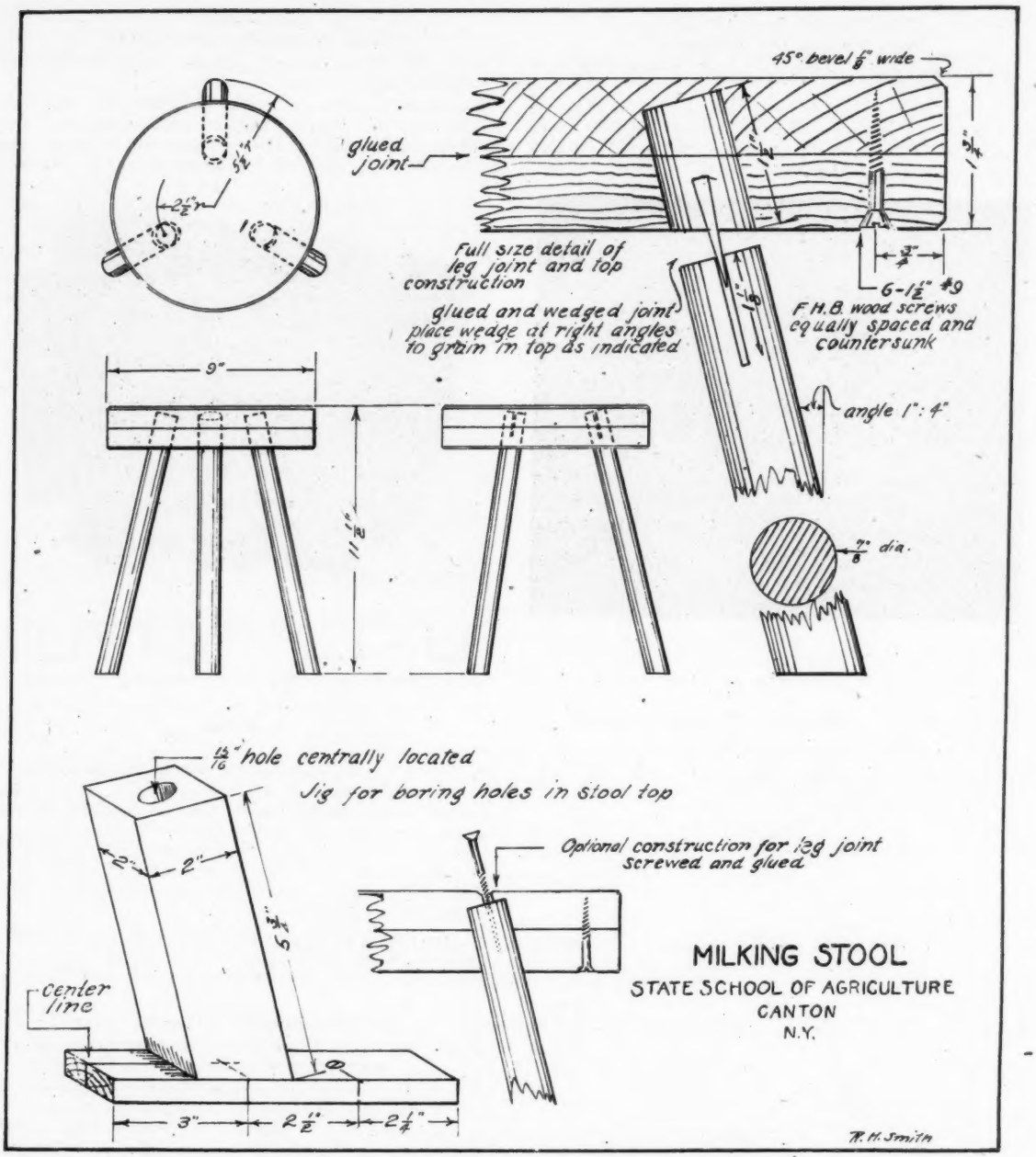
With the present high prices of materials not the least of the difficulties confronting a teacher of farm shop work is the selection of models that require little material and at the same time fill a definite need, securing the interest and best effort of the student and making him feel that something has really been accomplished when the piece is finished. The milking stool illustrated meets these conditions nicely. It is light, strong, neat-looking and useful, and when well made and taken home, performs the double purpose of advertising the work of the school and raising the standard of dairy practice as every neat piece of stable equipment does.

Required Materials.

Method of Construction.

Lumber.

No. of pieces.	Size and kind.	Where used.
2	10″x10″x13/16″ pine or basswood S2S	Top
3	1″x1″x12″ long, white ash or hickory, preferably split	Legs.
1	2″x2″x6″ long, hard wood	Upright for jig
1	½″x2″x7¾″ long, hard wood	Bottom of jig



DETAILS OF STOOL.

Hardware.

½ dozen 1½"—No. 9 F. H. B. screws for top.
One ¾"—No. 5 F. H. B. screw for jig.
4 6D box nails for jig.

Miscellaneous.

Liquid glue for fastening top, legs and jig.

Light gray automobile enamel, white lead, turpentine and oil, varnish to cover if desired.

Method of Construction.

1. Set the compasses at radius of 4½" and lay out two 9" circles on clear pieces of pine or basswood 13/16" in thickness, for the top.

2. Cut out tops with compass or turning saw, keeping edges vertical. (Band or jig saw may be used for this if shop is provided with either.)

3. Select best piece for upper surface of top and on the other piece, using the same center and a 3¾" radius (see detail) describe a 7½" circle ¾" from the edge. This is used in locating the screw holes.

4. With the same radius step off six equal spaces around this circle.

5. With gimlet or twist drill bore for No. 9 screws at these points and countersink.

6. Coat inner surface of top pieces with glue and clamping them together in the vise with grain crossed at right angles to prevent warping and splitting, fasten tightly together with six 1½"-No. 9 F.H.B. screws. Set aside to dry.

7. If straight-grained hickery or white ash block is available split out three pieces to dress 1"x1"x12" long for legs. If not rip these pieces from a straight-grained board.

8. Plane square, remove corners, making the stick octagonal, and finally finish round, making it a snug fit for a ⅞" hole. Make a test hole in a piece of hard wood to serve as gauge. Finish legs by scraping with glass

and sandpapering. Lathe may be used for this purpose if available.

9. Make a saw-kerf 1⅛″ long in the top end of each leg to take wedge (see detail), and make slim wedges to fit.

10. From a piece of 2″x2″ hardwood cut a section 5¾″ long, making one end square and cutting the other at an angle formed by using 1″ on the tongue of the square and 4″ on the blade. (Note: This piece should be of just sufficient length, including the thickness of the piece used under it, to permit boring to the proper depth in the top as it serves the purpose of both a depth gauge and angle gauge. To provide for possible variations in bit lengths, the piece just described can be made somewhat longer and cut to the proper length, after the jig has been assembled and the proper bit projection determined.)

11. By means of diagonals, locate the center of each end and with a 15/16″ bit, bore in from each end until the holes meet, making a clear hole from end to end.

12. Cut piece of hardwood 2″ wide by ½″ thick to the length indicated in the drawing of jig. Draw a center line down the middle and extend it across one end. (See drawing.)

13. With glue and 6D box nails fasten the lower part of the jig just made in place as shown in the drawing.

14. Drill a small hole and countersink it, and place a ¾″-No. 5 F.H.B. screw in the position shown to serve as a center, about which to revolve the jig when boring holes in stool top.

15. Place the 15/16″ bit in the hole at the top of the jig and bore clear thru the ½″ piece just attached to the bottom. Cut the upright part of the jig to the length required, permitting the bit to extend the proper distance for boring the holes in the top to the depth desired. See detail.

16. Place the top in the vise and with the spoke shave finish to a true circle. Test frequently with the try square to insure keeping the edge at right angles with the face. Where grain of wood makes use of spoke shave difficult, wood rasp may be used. When brought to a true circle, bevel top and bottom edges as indicated. Finish with sandpaper. If a lathe is available the top may be finished on the face plate.

17. Set the dividers at the same radius used for laying out the screw holes in the top, and selecting a point half way between any two screws, step around the circle again dividing it into 6 equal parts.

18. From the center by means of a ruler, draw light lines to alternate ones of the points so located, choosing the one to start with that will bring the legs in the best position. Care should be taken to see that no two legs are directly opposite each other along the grain of the wood. The lines so drawn should be extended to the edge of the stool top, by means of a try square, permitting their being located when the jig is placed in position for boring.

19. Place the jig with the screw point directly in the center of the stool bottom, as indicated by the point where the dividers were used, and swing it about until its center line coincides with one of the lines radiating out from the center of the stool bottom.

20. Clamp in this position in the vise and with a ⅞″ bit bore down through the hole in the jig, making a hole in the stool top for the leg. Repeat for the other two legs.

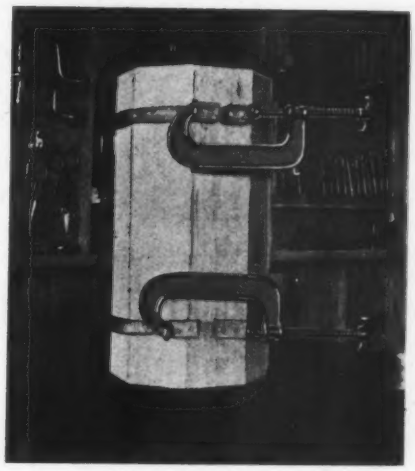
21. Make thin wedges of dry wood as shown in detail of stool top and after coating wedge, kerf, end of stool leg and inside of hole that it is to occupy with glue, drive into place. Place the wedge so that it extends across the grain of the wood in the top to avoid splitting. Note: Point of wedge only should be inserted in kerf before driving. As the leg is driven into place the wedge is forced into the kerf, expanding the end of the leg and making a very tight joint.

22. Turn stool bottom upward on bench and with stick cut 11½″ long as gauge scribe around each leg and cut off with saw. If necessary dress off with wood rasp until leg sets firmly on floor.

23. Clean up thoroly with sandpaper, being careful to preserve chamfers.

24. Give priming coat of white lead, turpentine and oil with drop black added to give gray color.

25. When dry, fill defects if any, with white lead putty and apply a coat of dust gray automobile enamel, or if desired a second coat of paint may be applied and the final finish obtained by a coat of valspar or other waterproof varnish.



THE COLUMN CLAMP IN USE.

A COLUMN CLAMP.

W. W. Nolin, Manual Arts Dept., Mt. Vernon, Wash.

The illustration shows a simple column clamp, devised by the writer in the Mt. Vernon High School shop. It is made of simple materials available almost anywhere and is very satisfactory for school use. It consists simply of a strip of thin strap iron, to the ends of which blocks of hardwood have been riveted. An ordinary carriage clamp does the rest.

WOOL BALING PRESS.

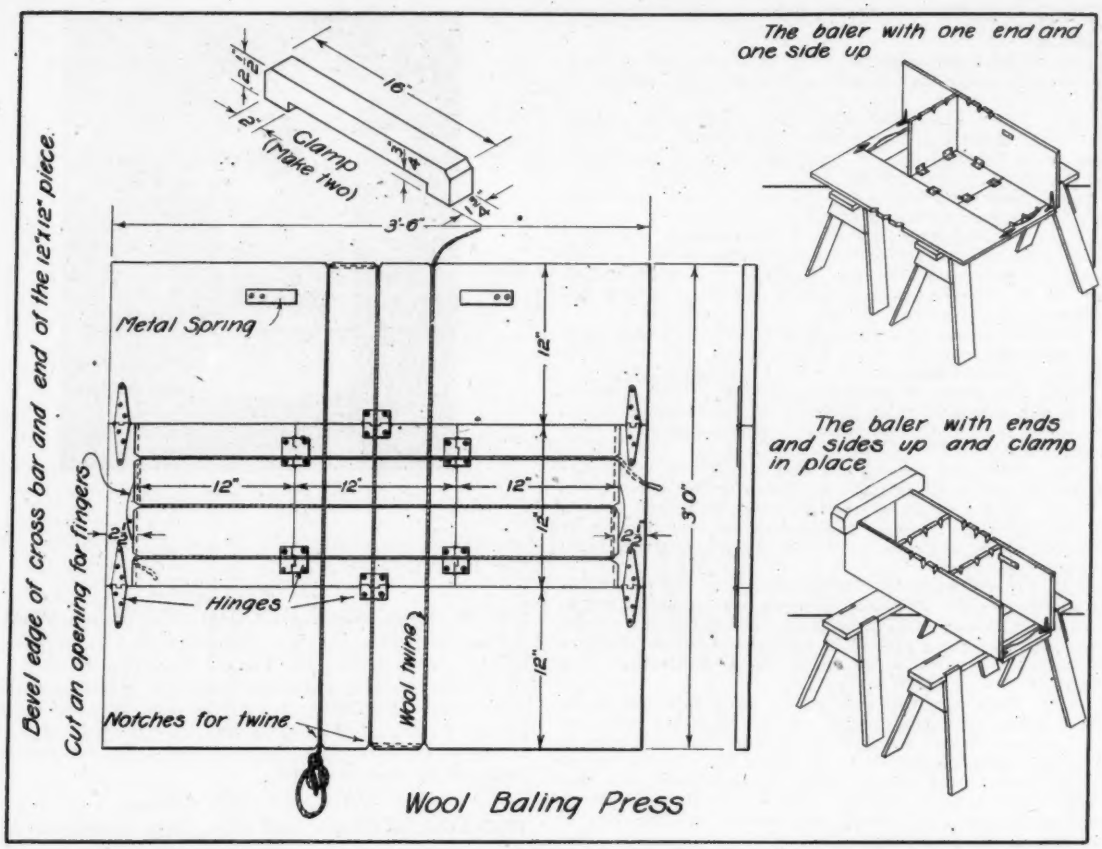
Prof. Louis M. Roehl, New York State College of Agriculture.

The wool baling press as a handy farm appliance saves enough labor and time by its use on sheep ranches and farms where wool is produced in any quantity to warrant its being made and kept on hand as part of the farm equipment.

As may be noted in the plan of the press, when it is open it is merely a platform on which the fleece is placed as on any platform or door that may be used for this purpose. By placing the twine on the platform as indicated and the fleece thrown on the twine the necessity of passing the twine around the fleece is dispensed with. As indicated in the detail drawings, the press is placed on a pair of sawhorses or other similar supports so that the manipulation of the press and the tying may be done by standing in an upright position.

The press consists of nine pieces of board as follows: 2 pieces ⅞″x12″x3′—6″ for the sides; 3 pieces ⅞″x12″x12″ for the ends and bottom; 2 pieces ⅞″x2½″x12″ for the cross bars; 2 pieces 1¾″x2½″x16″ for the clamps; 4 light strap hinges are used to fasten the sides to the cross bars at the ends and 6 2″ fast joint butt hinges are used to fasten the ends and sides to the bottom. Two pieces of spring metal approximately ⅛″x1″x4″ are fastened to one of the sides so as to hold the ends in place when they have been drawn up. An opening or recess is made in the side board and the metal spring pieces are placed so that their outer or screw ends are below the surface of the board and the other ends project out. Thus when the end members are drawn up the metal springs are pressed down into the recesses and spring out and hold the ends when in place.

It should be noted that the inside edges of the cross bars and the outer ends of the end pieces are beveled so that when the ends drop down flat they rest on the cross bars. It should also be noted that the inside edges of the cross bars have an opening cut so as to allow the fingers to get under the end boards when raising them.



Notches are cut in the outside edges of the sides and outside ends of the end members to hold the twine in place.

It is desirable to measure the required length of the twine and cut as many pieces as needed. Then tie a bowline knot in one end of each piece as shown in the drawing. Then after having placed the twine and fleece on the platform and folded the press and placed the clamps in position the end of the twine need merely be slipped through the bowline knot, then drawn up tight and tied.

TENTATIVE PROGRAM OF THE NATIONAL SOCIETY FOR VOCATIONAL EDUCATION.

The National Society for Vocational Education will hold its fourteenth annual meeting February 24, 25 and 26, at Atlantic City, N. J.

At the general session, the problems of part-time and continuation-school education, industrial rehabilitation, and future activities of the association will be discussed. At an agricultural session, a variety of topics dealing with teacher training, the Smith-Lever Act, measurement of vocational practice, short courses, and a program for agricultural education will be studied.

The industrial education section will listen to talks on foreman training, up-grading of staff, private training in industry, training of women in industrial plants. The vocational home making section will take up the topics of teacher training, wage-earning employment, and development of child care.

Thursday evening, February 24th, is reserved for the section dinners to be followed by a reception at the Million Dollar Pier.

SCHOOL CRAFTS CLUB MEETING.

The round-table meeting of the School Crafts Club of New York City was held December 18th at the Ethical Culture Building. The program was divided into two sections, entitled Little Ships and Christmas Toys. At the first table, Mr. Edwin Judd, Montclair, N. J., and Mr. Thomas Darling, New York City, discussed boat making projects, while Mr. Richard A. Beyer, Hoboken, N. J., talked on boat making as a hobby.

At the second table, Mr. William B. Courtney, Hackensack, N. J., explained the making of toys and the organization of a school bazaar at which the toys will be sold.

MAINE INDUSTRIAL TRAINING SESSION.

An interesting departmental meeting of the Maine Industrial Teachers was held on October 29th, with Mr. A. B. Hayes acting as chairman. The principal speakers were Mr. Paul C. Monohan and Prof. John G. Callan of Harvard. Mr. Monohan dwelt at length on vocational education for wage-earning employment, commenting especially on the methods of the Goodrich Tire Company's School. He explained the value of vocational courses for the boy or girl who has already molded and started to shape their life career. He declared that such courses should never be offered below the junior class of the high school and pointed out that they are easily adapted to high schools. Public schools, he said, can offer better vocational courses than can be found in the industrial plants themselves.

Mr. Callan prefaced his address with an explanation of the human relations constituting part of factory management, and showed how efficient management depends wholly upon human relations between the men and the officials. Mr. Callan advanced the idea that the resources of the country are adequate to consumption and that intelligent organization of industrial effort has brought this about. The economic man, he said, is cold-blooded and heartless in his methods and plays a game against nature, but the businessman is the only practical man. Factory management, in its final analysis depends on faith in human relations.

Students Build School Building. Between two and three hundred students of the vocational department, Kansas City, Mo., are giving a practical demonstration of their ability in manual training. Under the direction of the instructor the students have begun the erection of a one-story building to be devoted to instruction in music.

MONTANA TEACHERS MEET.

There was an unusually large attendance at the annual meetings of the Montana Teachers' Association which took place in Billings, November 22nd to 24th.

A joint meeting was held with the Industrial Section at which various phases of Vocational Education were discussed. A paper on "The Present Trend in Home Economics in Our Public Schools" was given by Miss Gladys Branegan, State Director of Vocational Home Economics. Later tea was daintily served by the Home Economics pupils of the Billings High School.

At a second meeting the following program was presented:

"Recent Developments in the Teaching of Home Economics," Miss Edith Franks, State Agricultural College, Bozeman.

"A Study in Foods and Nutrition," Miss Georgia Anderson, High School, Harlowton.

"The Care and Repair of Clothing," Miss Myrtle Kuhns, County High School, Big Timber.

"The Benefits of a State Home Economics Association," Miss Blanche Lee, Acting State Leader of Home Demonstration Agents.

Following this the assembly voted to organize as a state association in view of affiliating with the national organization. The following officers were elected to promote the work during the coming year:

President, Gladys Branegan, State Supervisor of Home Economics, Bozeman.

Vice President, Olive Balcke, Fergus County High School, Lewistown.

Secretary, Inez Foster, Home Demonstration Agent, Billings.

Treasurer, Edith Franks, State College, Bozeman.

With Home Economics and Institutional Workers and home-makers as members, the Association hopes to play an active part in promoting the welfare of the homes of Montana.—Olive A. Balcke.

MICHIGAN TEACHERS MEET.

The Manual Training section of the Michigan State Teachers' Association met in St. Mark's Parish House, Grand Rapids, Mich., October 29th, 1920, at 9 a. m. Mr. F. R. Kepler of Detroit presided. In his introductory remarks, Mr. Kepler pointed out that the program was largely devoted to industrial education because that was the problem about which manual training teachers were most concerned.

Mr. E. Lewis Hayes, supervisor of vocational education in Detroit, presented a chart showing the factory organization of the modern plant. He showed the places where unskilled labor, skilled labor, apprentices and technically trained men fitted in and the opportunities for promotion for each group. Mr. Hayes also discussed the industrial information courses and industrial trade courses carried on in Detroit and the opportunities for students of these classes.

Miss Cleo Murtland, associate professor of industrial education at the University of Michigan, spoke on the need for trade courses for girls and women. In her talk she showed the justice of this demand and the great need of differentiation in their courses.

Dr. George E. Meyers, professor of industrial education at the University of Michigan, discussed the new developments thruout the state and gave a report of the numbers in Smith-Hughes classes in the several cities. He discussed the program of the continuation school made necessary by the James law which provides for part time work in school up to 18 years of age.

Dr. Meyers was followed by Dr. K. G. Smith, recently appointed supervisor of industrial education in Michigan. Dr. Smith presented a chart showing the functions of each kind of school in properly caring for the various types of students. In addition, he recommended the appointment in cities of a director of guidance and placement. He added that guidance without placement does not amount to much and that this department should have a representative in each school. Among other things, he recommended a survey of various industries.

During the business session Dr. Meyers moved that the manual training section recommend to the Michigan State Teachers' Association that a vocational education department be organized. This department would be composed of the agricultural home economics and manual training sections.

Dr. Meyers moved that the name of the section be changed from manual training section to "manual arts and vocational education section." After much discussion the motion was carried.

Mr. Percy Angove of Ionia was elected president. The meeting was attended by 150 teachers and was one of the most interesting in the history of the association.—H. N. Eddy, Secretary.

CONFERENCES ON TRADE AND INDUSTRIAL EDUCATION.

The first of a series of district conferences on trade and industrial education was held December 3rd and 4th, at Kansas City, Mo. Representatives from all states bordering on Missouri were present. Kansas was well represented by the men who plan to put the new vocational program for the state in operation the coming year.

The conference resulted in a splendid understanding of conditions, and opportunity was given for men and women in trade schools to present concrete problems for consideration by the representatives of the Federal Board.

Mr. Lyner of the Santa Fe system led one of the discussions, which was followed by a talk on apprentice schools by Mr. Thomas. Mr. C. F. Kleinfelter, in his discussion of evening school problems, placed the blame for heavy losses in attendance at these schools on the failure to arrange short unit courses of eight weeks each. Mr. Cushman seconded Mr. Kleinfelter when he declared that modern education, especially in evening schools, should be served cafeteria style in short unit courses. Mr. J. C. Wright exhibited blanks covering types of work accomplished in conducting a study in occupational analysis.

One of the interesting subjects treated was that by Mr. Lewis H. Carris, who outlined the government's plans for industrial rehabilitation. Mr. Carris brought out the fact that since all vocational education is given for the removal of a vocational handicap, it follows that this must be the basis for training men and women disabled in war or industry. Physical rehabilitation is the responsibility of society rather than of the school.

Following the banquet at the Jane Hayes-Gates Institute, the meeting was thrown open to the Vocational Teachers' Club of Kansas City and the visitors were encouraged to discuss the day's problems as they touch executive and teacher, employer and employee, teacher and pupil.—C. A. Barrett.

HOME ECONOMICS TEACHERS OF NEW YORK MEET.

The meeting of the Home Economics Section of the New York Teachers' Association was held November 22-23, at Rochester, N. Y.

At the first day's session, Mr. L. A. Wilson, Director of the Division of Vocational and Extension Education, Albany, spoke on the subject "The Problem of Vocational Training in New York State with Respect to the Work of Women and Girls." Miss Marion Van Liew and Miss Treva Kaufman, specialists in vocational education for girls, gave an outline for New York State's Plan for Home Making. At one o'clock in the afternoon, a luncheon was served for heads of home economics departments, teachers of methods and supervisors of practice, and teachers of teacher-training institutions of the state. Miss Van Liew then discussed the New York State plan for home making education, which was followed by discussions in charge of Miss Van Liew and Miss Kaufman.

At the second day's session, the general program was devoted to art, industrial arts and household arts. Miss Anna S. Richardson, of the Federal Board of Vocational Education, discussed "The Development of Home Economics under the Federal Board of Vocational Education." Miss Anna Cooley discussed "Practical Arts in the Junior High School;" Miss Agnes H. Craig talked on "Community Service and the Home Making Teacher;" Miss Treva Kaufman explained "The Home Project," and Miss Marion Van Liew discussed the work of the "State Aided Schools of Home Making."

At the business meeting the following officers were elected: President, Miss Cora Winchell, Teachers College, Columbia University; Vice-President, Miss Edith M. Barber, Home Demonstration Agent, Syracuse, N. Y.; Secretary-Treasurer, Miss Edith A. Sarver, Supervisor of Household Arts, Schenectady, N. Y.—May E. Benedict.

Now, Are There Any Questions?

This department is intended for the convenience of subscribers who may have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from persons who are competent to answer. Letters must invariably be signed with full name of inquirer. If an answer is desired by mail, a stamped envelope should be enclosed. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Finishing Bronzed Articles.

146. Q:—Could you give me the following information or where I might obtain it:

I wish to finish up some hand carved picture frames using the liquid gold or bronze and tone the same afterwards. How the size is made of plaster of paris or whiting, whichever it is. The complete process in treating the frames.—C. D. G.

150. Q:—I would like a formula for making the foundation on the raised bronze lamps, book ends, similar to the Polychrome ware. Also the best process for bronzing and coloring. I have a great many very large spools I hope to use as bases for candlesticks.—R. T.

A:—Assuming that the carving is rather heavily cut and in bold relief, as is necessary for this class of work, and the frame mitered and cut preferably with a spline joint, the whole should then be given a coat of heavy glue size of such consistency that it will partly strike in and yet leave a small amount of dried, glossy material on the surfacing after hardening. Of necessity, this variance in consistency will be governed by the kind of wood of which the frames are made, in that hard wood will demand fairly thin glue, while soft wood will require much heavier. Either solution must be applied quite hot, preferably with a Fitch flowing brush. The work should be given at least forty-eight hours to dry in a warm room.

The plaster coat which may now be laid on, is made up from dental plaster to which has been added two ounces of whiting per pound of plaster. The dental plaster should be used since it has a very small coefficient of expansion while commeroial plaster paris has a very marked tendency to shrink. This should be mixed thoroly in a tin cup with enough water to form a body as thick as varnish and should be applied with a soft bodied brush as in the case of the glue size. It will take some practice and experience to learn to handle this material properly, as it is a part of one of the most exacting phases of the gilder's trade.

Avoid mixing any great amount of this putty-coat as it hardens very soon and so must be worked up quite rapidly. The greatest difficulty to be encountered is for the beginner to learn to handle the material in successive patches without contaminating the new batch with small particles of older, hardened plaster. For this reason it is best to keep two cups in use and when one batch is used up, the second may be soaking in a pail of warm water and then be readily cleaned with a stiff brush. This putty or plaster coat should be built up until at least one-sixteenth of an inch of plaster covers the work. All veining and other lines may be pointed up with a tool dipped in water, altho it is preferable that these lines be not too strongly accented, otherwise the softening effect of the plaster will be lost.

The completed frame should be allowed to dry in a warm room to season for at least a week. Any small checks or cracks which develop may then be pointed up and allowed to dry and harden thoroly. At this point all other work should be gone over with a 0000 split polishing paper. Following the sandpaper the work should be given a coat of pale japan gold size, preferably Pratt & Lambert's, slightly reduced with enough turpentine to allow to brush on freely. It may be necessary to repeat this coat in order to thoroly fill up the plaster coat and stop all suction. As soon as the last coat has begun to get the least bit tacky, put the bronze powder in a small bag of cheesecloth to form a pounce about an inch in diameter. By holding this over the work and tapping it lightly against the thumb nail, the japan will absorb sufficient bronze to give a good foundation. When this has hardened up, the extra bronze may be removed by holding the frame upside down over a piece of clean paper, and rapping the back of the frame.

If it is desired to burnish any of the high lights, this should be done by sizing the parts with a little of the japan and when tacky laying on a little gold leaf and gently pouncing it into place with a small pad of cotton. When hard it may be burnished with an agate burnisher or if this is not obtainable, the hard bone handle of an old toothbrush may be used instead. After the frame is completely burnished and gilded, it should be given a coat of bronzing liquid or a thin coat of starch solution in case a dull effect is desired. The starch solution is made by rubbing up a small amount of laundry starch in cold water and then adding enough boiling water to make a clear and not too thin solution of cooked starch. This may be brushed on the work and when dry will become perfectly flat without any gloss. In order to brighten the work at any time, this starch coat may be removed by washing with a soft sponge and warm water, thereby removing the dirt and stains as well. Recoating with the starch solution should bring the work back to its original brightness.

Where spools or book ends are to be used for wooden bases of polychrome ware, they should be turned or shaped an eighth of an inch smaller than the desired finished dimensions. In the case of carving on a candlestick and where it is desired to repeat the design in a large number of pieces, it is best to turn and carve one candlestick to accurate size, and detail and finish, with several coats of varnish while still in the lathe.

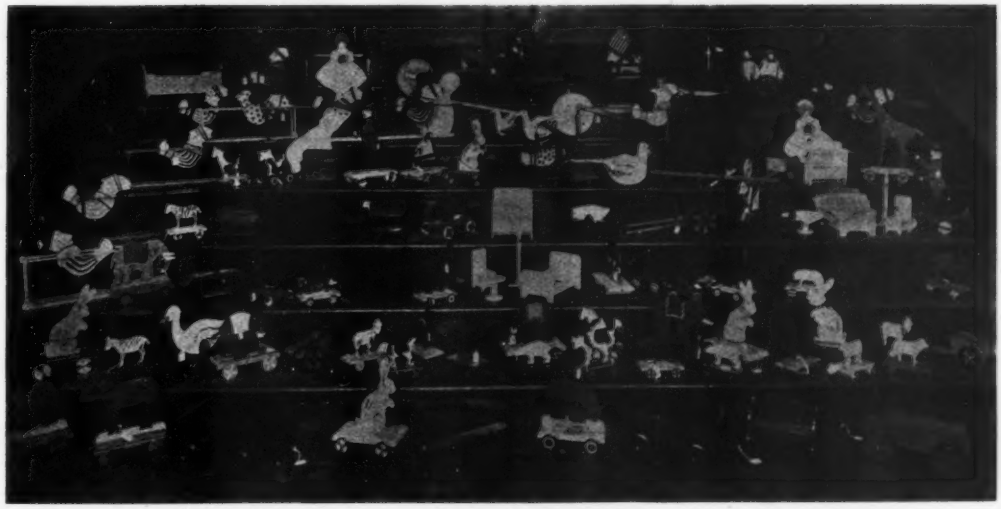
After this varnish coat is dry and hard, the candlestick should be used as a pattern in making a half split plaster paris mould. As soon as the plaster is hardened it should be opened up, the pattern taken out and any injured portions pointed up and repaired. It should then be allowed to dry in a warm room until entirely free from moisture. By warming it slightly, melted paraffine may then be brushed on until the whole surface is coated clean and all portions satisfied with paraffine, so that the mould will not again absorb water in subsequent use. When a mould has cooled and the paraffine hardened, it may then be polished with a stiff rubbing brush so as to leave a very smooth and hard, bright surface ready for use. The two halves of the mould should be carefully centered and locked and the core carefully centered. The putty coat may be then run in by mixing it thin as for the brushing work but should not be disturbed for at least four hours after pouring. The mould may then be opened and the cast pattern set aside to harden. At this point the sandpapering and pointing up may proceed as for the picture frame work.

Owing to the large number of different colored bronzes which are available on the market, many different blends of colors and varied effects may be obtained. The back files of the Industrial-Arts Magazine for the current year contain several articles, chief among which is that one on the subject of "Bronzes and Their Use." This will afford considerable information as to the method of using different glazes for shading at the base of relief carvings.—R. G. Waring.

Books on Basketry.

148. Q:—As a salesman in the Basket section of the Philadelphia Wanamaker store, I am asking you for a short bibliography on the Materials of Basketry. I wish this not for the hand making of baskets, but to identify and understand the various materials. Can you suggest a few magazine articles of value for my purpose?—C. H. C.

A:—Following is a list of books on basket materials: Pine Needle Basketry in Schools, Wm. C. A. Hammel, Bulletin 1917, No. 3, U. S. Bureau of Education; Illustrated History of Indian Baskets and Plates, T. A. Roseberry, 1260 California St., San Francisco, Calif; Pine Cones and Needles, E. F. Davis, East Machias, Washington County, Me.; Basket Willow Culture in New York State, J. W. Stephen, State College of Forestry, Syracuse, N. Y.; Basket Willows, W. F. Hubbard (Rev. Ed. 1909), Superintendent of Documents, Government Printing Office, Washington, D. C.; Willows: Their Growth, Use and Importance, G. W. Lamb, Superintendent of Documents, Government Printing Office, Washington, D. C.; Useful Fibres of the World (Juncus Effusus), Dodge; Fibres and Fibre Cultivation, C. F. Wicker, Pan-American Magazine, M. 30; 13-24 N. 1919; Brazilian Fibres, J. E. Agan, Bul. Pan-American Union, 50; 394-404 April 1920; Basket Willow Culture, G. W. Lamb, Farmers' Bulletin, 622; 1-34, 1914; Use for Pine Needles, Sci. Am. 119; 440 N. 30, 1918; Wire Grass Basketry, C. B. Whitehouse, Art World 2; 485-7, Aug. 1917; Palm and Pine, Country Life, 35; 39 March 1919.



TOYS MADE AT ROCHESTER, N. Y. Mr. Raymond C. Keople, Supervisor of Industrial Education.

Heat Treatment.

152. Q:—We are discusisng in our machine work the subject of the treatment of iron and steel. I would like a book that explains thoroly the subjects of "Annealing," "Tempering," and other heat treatments of iron and steel. I find very few discuss these subjects, but rather the handling of metals. I would not want a very expensive treatise.—G. A. T.

A:—Press Working of Metals, Oberlin Smith, John Wiley & Sons, New York; Metal Working, Paul Hasluck, Funk & Wagnalls Co., New York; Metal Work, Adam & Evans, Longmans, Green & Co., New York; Principles of Setting Out, Alfred Parr, Longmans, Green & Co., New York; Steel, E. R. Markham, $2.50, N. W. Henley Pub. Co., New York; Hardening, Tempering, Analyzing & Forging of Steel, J. V. Woodworth, $2.50, N. W. Henley Pub. Co., New York.

Forge Troubles.

153. Q:—We have two forges installed in our manual training shop which we haven't been able to use due to the lack of a proper draft. Both forges enter their smoke pipes into a chimney, which isn't used for any other purpose. Can you suggest any means by which this difficulty can be overcome? We desire some simple scheme which wouldn't cost a great deal.—A. G. W.

A:—Perhaps one reason that the forges do not draw the smoke into the chimney is because the chimney is not high enough over roof of the shop. I would suggest that a sheet iron pipe extension be placed on the top of the chimney, making it higher. One forge to a flue is enough to get good results. The pipe from forges entering the flue should be at least a foot or more higher thru the elbow. A blast of air from the fan into the pipes would carry smoke out. Any forge, no matter how it is constructed, handled by an inexperienced worker, is liable to smoke when the fire is being built. If one piles on the fire a lot of green coal, without an airhole at the top, it will smoke more or less for a while, until the coal is well coked.

I would suggest that after the green coal is placed onto the fires in these forges, they should be well loosened up at the top with a poker, then allow the fire to burn for a little while without using blast. This has a tendency to dry out the coal and burning the smoke. Also place the green coal on the sides and back of fire when rebuilding it, leaving the center open.—Thomas F. Googerty.

MONTANA INDUSTRIAL TEACHERS MEET.

The Montana Industrial Teachers held their meeting on November 22nd, in connection with the State Teachers' Association. The work taken up consisted of the vocational aspects of industrial education. Mr. A. T. Peterson acted as chairman of the meeting.

At the meeting, one section was devoted to home economics, agriculture, and trade and industrial work. The speakers were Miss Gladys Branegan, State Director of Vocational Home Economics, H. A. Tieman, Regional Director for Montana; M. J. Abbey, State Director of Agricultural Education, and G. B. Edwards. Round-table discussions followed the set program which was attended by a large number of teachers.

At the meeting of trade, industrial and agricultural teachers, state directors took part, while Supt. Maddock of Butte, talked on "Part-Time and Evening Schools." Supt. Logan had a strong paper on "Services of Schools in Agriculture." State Directors Abbey and Edwards added materially to the success of the program, the former discussing the subject "Effective Agricultural Instruction" and the latter talking on the subject of "Rehabilitation."

The officers chosen for the next year were Mr. A. T. Peterson, Miles City, President, and Mr. C. W. Gray, Lewistown, Secretary.—A. T. Peterson.

NEWS AND NOTES

Soldier Students Sell Jewelry. An exhibit of jewelry made by war veterans was recently held at Memorial Hall, Providence, R. I., to which the public was invited. Bracelets, brooches, necklaces and rings made up the display of work of 160 soldier craftsmen attending the classes at the School of Design. The proceeds of the sale go to the men who make the articles.

Show Card Class Has Record Enrollment. The show card class opened at the high school, Lawrence, Mass., enrolled the maximum number of students, with a waiting list. It is planned to open a second class and to follow the present course with a more advanced one in commercial and magazine illustrating.

Boys Make Useful Things. The students in the continuation school at Springfield, Mass., have made a number of useful things. In the wood working department, such articles as clothes racks, ladders, typewriter tables and book racks have been made. The boys in the machine shop have turned out reamers and mandrels, those in the sheet metal department have made match boxes, blotter holders, and dust pans, while the boys in the printing department have printed a great deal of material for the use of the schools. The boys have printed more than fifty songs to be used in the assembly periods.

Exhibit of Drawings. A window display of drawings made by high school students at Bangor, Me., was recently held. The display included commercial illustration advertisements, window cards, posters, original designs in batik, covers for folders and sporting booklets, boxes, pencil, charcoal and pen-and-ink work.

The Danger in Vocational Education. Dr. Frank P. Graves, Dean of the School of Education, University of Pennsylvania, discussing the vocational education move-

ment before the Central Ohio Teachers' Association recently, declared that there is a big danger in vocational education as it has been used in the schools. Vocational education has been developed, but while it marks a great advance, it also involves a danger. He declared the schools have been rushing in headlong to supply it, without due regard to the ways and means. We are still in bondage to the past, he said, where manual labor was menial, to be performed only by serfs. We can dignify labor by giving an important place in the curriculum to industrial pursuits and causing pupils to realize it is just as important as professional work.

Holyoke Opens Continuation School. A continuation school has been opened under the direct supervision of the school board. There will be a faculty of nine teachers, with two academic and two nonacademic teachers for boys' classes, and two academic women teachers and two nonacademic teachers. The course will include English, arithmetic, civics, hygiene, typewriting and bookkeeping and filing.

Want Technical High School. The faculty of the Manual Training High School at Peoria, Ill., has asked that the school be reorganized into a technical school similar to the Lane School in Chicago. It is planned to erect a new building and to use the present structure for a continuation school.

To Fit Industrial Cripples for Trades. Governor Smith of New York State has been given the program under which the state plans to return to useful lives, such persons as have been permanently injured in the industries. The plan calls for close cooperation between the state education department and the industrial commission. The sum of $75,000 has been appropriated by the state and the federal government will provide an additional $75,000.

Stands High in Vocational Education. Idaho, altho one of the smallest states in the union in point of population, has attained a leading place among the western states in the amount and quality of vocational work, according to the director of vocational education. There are thirty high schools conducting Smith-Hughes work, with twenty already designated and thirty more applying for recognition as Smith-Hughes schools in vocational economics. More than thirty trade schools and classes will be conducted this year according to estimates of the director. The superintendents of the state are interested and are anxious to introduce agriculture and economics courses, and to connect the schools with the industrial work of the communities.

Addition to Education Department. A new division of the New York Education Department has been created with the title of vocational and extension department. The division which is in charge of Mr. Louis A. Wolson, will have the powers and exercise the functions of the division of agricultural and industrial education, and will have general supervision of the work of the department relating to extension education—including the development of special extension courses thru cooperation with universities, colleges and institutions of less than college grade—the organization and supervision of evening schools, home classes, factory classes and afternoon classes; Americanization work and educational work among foreign and native-born illiterates and other extension activities. The division will also have charge of the rehabilitation activities provided for under the state and federal acts, including the advisement, training, placement and followup work of disabled persons who apply for vocational retraining.

Founds Vocational School. Thru the will of Harriet B. Clough, of Gloucester, Mass., $10,000 is left to the city, the money to be held in trust until it accumulates to $100,000, when the income is to be used for the establishment of a vocational school.

High School Girls Make Baking Record. Eight girls of the Vocational High School, Minneapolis, Minn., recently established a record when they baked ten pies, eleven cakes and 151 doughnuts in two hours and a half. In the sewing department, one student in five weeks' time completed six kitchen aprons, two coverall aprons, two nightgowns, one middy, three guimpes, four rompers and one dress.

Evening Industrial School Opened. The evening school at Beverly, Mass., opened for the season with classes for women in sewing, millinery, home care of the sick, and reading of blue prints. For men there will be instruction in drafting, tool making, machine shop practice, electricity, pattern making, plumbing, carpentry and stationary engineering. The school is open to any resident of the state who is over 16 years of age.

PERSONAL NEWS.

Mr. E. A. Wreidt, formerly supervisor of industrial education for Illinois, has been appointed State Director of Vocational Education of Indiana. Mr. Wreidt succeeds J. C. Collicott, who resigned.

Mr. Geo. I. Stevens of Billings, Mont., has been appointed to the state office of the Federal Board at Helena. Mr. Stevens will be the field agent and will work under Mr. Lief Fredericks.

Mr. Charles E. Thomas has been made instructor in automobile mechanics at the East High School, Erie, Pa. More than sixty prospective students enrolled for the first year's work this fall.

Mr. D. B. Peterson has been appointed instructor in wood working at the East High School, Erie, Pa. Mr. Peterson has the necessary teaching qualifications, combined with an experience of twenty years as a practical carpenter.

Mr. J. F. Jeffery has been made instructor in drafting at the Gridley Junior High School, Erie, Pa.

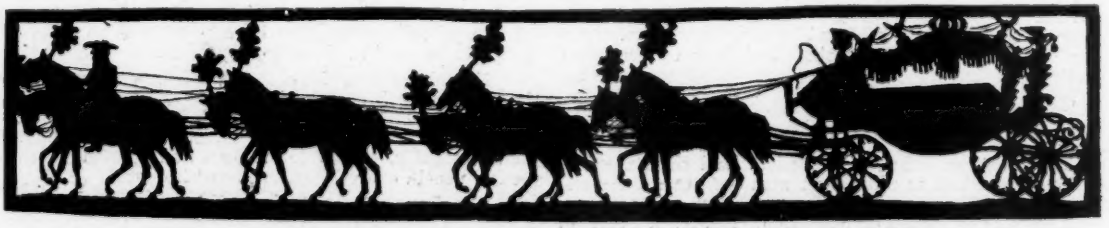
Mr. A. G. Norris, Supervisor of Trades and Industries of the Missouri Board of Vocational Education, is acting as temporary principal of the Lathrop Trade School, at Kansas City, since the departure of Mr. Cushman.

The Lathrop Trade School, Kansas City, Mo., has secured as head of the printing department, Mr. F. C. Clippinger, who succeeds Mr. Bush. Mr. Clippinger learned his trade in a "country shop," and was for some time head of the linotype department of the Kansas City Star.

H. G. Martin, director of the Isaac Delgado Central Trades School of New Orleans has undertaken to teach a blind man to become an instructor in trade school work. Thomas Slough, who some years ago was a skilled mechanic in machine shop work and electrical construction lost his sight entirely by an accident in the shop. For many years he was in no position to earn his living until the Louisiana Commission for the Blind opened a broom making shop where Mr. Slough found employment.

Director Martin having observed that Mr. Slough possessed both skill and ambition suggested that he learn to be a teacher. The broom maker grasped the opportunity and has attended the lectures of Director Martin in the temporary quarters of the Delgado school. Mr. Martin has notes prepared of his lectures and these are translated into the Braille writing system for the blind.

Mr. Robert M. Smith, formerly supervisor of manual training in the Chicago schools, has accepted a position in the high school at Americus, Ga.



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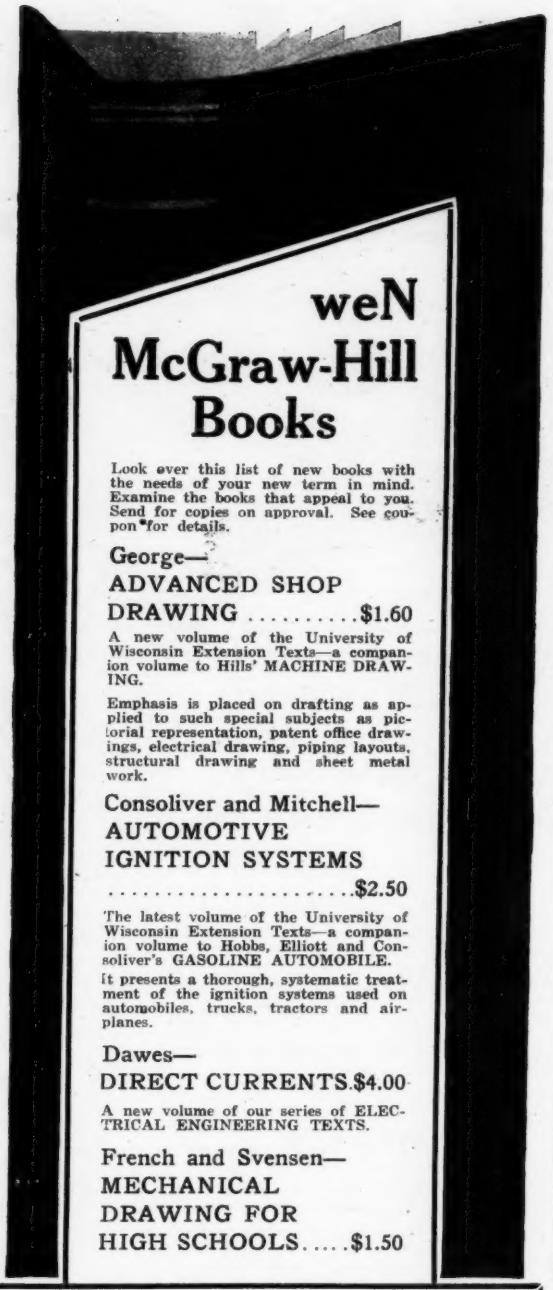
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NEWS AND NOTES.

To Form Vocation Bureau. The Michigan Teachers' Association, which held its meeting at Grand Rapids, on October 28 and 29, discussed the organization of a department of vocational education. It is the purpose of the teachers to unify the several sections of the association under one division in both the State Teachers' Association and the Schoolmasters' Club for the purpose of correlating their efforts and preventing duplication of work. The original committee of five which studied the matter, has been assigned as officers of the new association, with power to proceed with the work of securing recognition. Mr. Charles A. Wardner, Director of Vocational Education at Jackson, Mich., is chairman.

A Vocational Education Survey. During the week of December 13th, a vocational education survey of Jackson, Mich., was made by a committee composed of well-known state officials. The personnel of the committee comprises Mr. Kenneth G. Smith, Supervisor of Industrial Education, Lansing; Mrs. Martha H. French, State Supervisor of Home Economics, Ypsilanti; Dr. G. E. Myers, Professor of Industrial Education, University of Michigan, Ann Arbor, and Miss Cleo Murtland, Assistant Professor of Industrial Education, University of Michigan. The purpose of the survey is to ascertain existing conditions and needs in vocational education, and to provide valuable data for the general conference.

Offer Automobile Mechanics. The course in automobile mechanics, offered at Quincy, Ill., for the past few years, has been extended to cover two full years of work. The work which is given in connection with the manual training work, is devoted to a study of the automobile from an engineering standpoint, with lectures, demonstrations and practical followup work. The course is open to boys of the Senior High School, Junior High School, and to those in the grades above 14 years of age. Mr. A. M. Mercker is Supervisor of Manual Training Work.

An Exhibition of Toys. A varied and extensive exhibition of toys was held on December 10th, at the Lattimore School No. 11, Rochester, N. Y. More than two hundred pieces were on display, including dolls, tumblers, wheelbarrows, dolls' furniture, cut-out animals, carts and settees. All of the toys were constructed, decorated and painted by the manual training boys of the school under the direction of Miss Ethel H. Severance. A sale of the boys' products produced $125, the proceeds over and above the cost of materials, to be used to purchase an article for the school.

High School for Wage-Earners. A cooperative high school for boys and girls in New York City will be established in September. The school will offer commercial courses and the students will be drawn from the classes in Morris, Bay Ridge, Newtown, Bushwick, Erasmus Hall and other high schools. About one thousand pupils will be accommodated, two groups of five hundred each alternating between school and business.

A Day Apprentice School. Dublin, Ireland, has come into possession of a day school for apprentices, which has been established under the auspices of the Skilled Employment Association. The students are registered or indentured as apprentices, and an effort is made to transform them into skilled workmen. The plan has been taken up with enthusiasm as shown by the fact that some two hundred boys appeared for the first entrance examinations.

Industrial Art Work in New York City. With a view to bridging the gap between classroom activities and those of the trade, the Irving High School of New York City has for some time been experimenting with professional art problems. The students are trained to become practical art workers and at least a hundred of these young people each year take their places in the industries to become designers, illustrators, decorators and letterers.

Following a survey of the industries employing art workers, it was deemed advisable to establish the connection made, and an instructor was employed to devote a portion of her time to a studio for seventh-term students in professional practice. Practical workers in the profession were persuaded to promote the training thru classroom instruction and expert advice. They also conducted special groups of students on visits to factories and workshops for observation purposes. Several students have become interested in the design of printed textiles and have studied at first hand the processes of engraving,

(Continued on Page XXII)

ANNOUNCEMENT

To

Superintendents, Manual Training Instructors and All Interested in Industrial and Vocational Education

For a long time, it has been the policy of the House of Disston, not only to supply manual training schools with saws, tools, and files, but to give all assistance possible in the great work of training the boy to use his brain and hands together in constructive work.

Take, for instance, our educational literature on saws, tools, and files. "The Saw in History," "The File in History," "Why a Saw Cuts," "Saw Chart," "File Chart," "How a Hand Saw Is Made," are some of the Disston books published for use in schools and distributed without cost to instructors. In a great many schools these books are now in use as text-books.

In every available way, we are trying to assist in teaching boys to use and care for tools properly.

It is our purpose to increase our activities in this line; to give more and more assistance to instructors who are interested in teaching boys to use tools. .

In this connection, we will use regular space in this publication to tell about material and suggestions we have available for you.

The information appearing on these pages will be trustworthy and practical. Its preparation will be supervised by men familiar with school work and experienced in this particular field.

We say in all sincerity that it will be well worth your time to follow these pages, which will be devoted to YOUR interests (which are, of course, OUR interests as well) and to make use of the aids which will be offered in them without cost.

(If you have some question, some problem, in your work that relates to the making, use or care of saws, tools, or files, why not write us? We are ready and eager to render all possible assistance.)

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(Continued from Page XX)

dyeing and printing. A designer has been employed to give classroom instruction in the practical technique of designing for reproduction.

The school recently held an exhibition of art work, to which were invited buyers, designers and manufacturers. The designs were criticized from a practical viewpoint and several were purchased, resulting in further visits and sales of products. The school now has associated with it such firms as Cheney Bros., A. S. Rosenthal, Susquehanna Mills, Marshall Field, Blanck & Co., and many others.

The Manual Training Teachers' Club of Kansas City, as a body, has taken an extension course at the Kansas State Agricultural College. The outline of the work covered is quite extensive and is based on the general subject of "Industrial Education." The outline includes (1) Historical and modern viewpoints; (2) Vocational and cultural education; (3) Manual training and industrial education; (4) Analysis and definition of terms; (5) Trade schools; (6) Evening schools; (7) Women in industry; (8) Vocational guidance; (9) Unit and dual control; (10) Course of study, finding problems and surveys; (11), Teacher training, and (12) Smith-Hughes Schools.

Iola, Kans. The eighth grade has been reorganized as an intermediate school. Manual training is offered to boys and cooking and sewing to girls.

The Eastern Ohio Teachers' Association held its annual meeting November 26 and 27, at East Liverpool. The speakers at the several sessions were Dr. S. Parkes Cadman, Brooklyn, N. Y.; Miss Mabel Carney, Columbia University, New York; Dr. John W. Hoffman, Delaware; Dr. W. H. McMaster, Alliance.

Miss Mary McDonald, Zanesville, was in charge of the primary section, Miss Josephine Hammond, Steubenville, of the grammar school section, Mr. W. H. Leach of the high school section, Mr. I. W. LaChat of the music section, and Mr. J. V. Nelson of the supervisors' section.

A Publicity Committee. The art department of the New York City high schools has appointed a publicity committee, which has for its duties the work of keeping the public informed as to what the schools seek to do, and the encouragement of schools which seek to present the results of their best efforts. It is the opinion of the school authorities that proper publicity is necessary to progress and that a growing interest in art work reacts upon the schools and stimulates them to renewed effort.

The committee has formulated a set of rules which seek to guide teachers in preparing writeups for the daily or professional press. They read:

1. What to write about. Proposed activities such as exhibitions, museum visits, special lectures, etc. Items should interest a number of people.

2. How items should be written. Each item should consist of one or two paragraphs. They should be written on one side of the paper, with wide margins. The heading, or caption, should be very brief.

3. Points to be remembered. Aim to tell the story simply. Introduce the name of the school in an early sentence, give dates if required, and names of those engaged in the work.

4. Errors to be avoided. Do not comment in editorial fashion in a news item. State facts, but do not express opinions. A study of news items in the daily papers will show good forms to follow.

5. When to write. Send out an item at least once a fortnight and an effort should be made to keep a record of items which appear. The clipping book is found useful as time goes on.

6. Good rules to follow. Use short sentences, simple English and few adjectives. Tell the main parts of the story in the first three or four sentences, and make each paragraph four or five sentences long. Avoid flowery writing and use fewest possible words. Begin an article with a direct statement, be careful to punctuate and reread all copy before turning it in.

Grade Pupils Make Posters. The pupils of the sixth, seventh and eighth grades at Akron, O., during the first week of December, made posters, using as their subjects better health, Thanksgiving, Christmas and various school activities. About fifty posters were collected, of which six were the winners at the selection made on December 6th.

(Continued on Page XXV)

(*Continued from Page* XXII)

New Part-Time Classes. The part-time classes of the Akron, O., schools opened January 3rd, under the direction of Mr. R. H. Waterhouse. Classes have been formed in factories, stores and school buildings.

That the spirit of Fitchburg Normal to "put things over" still holds forth with its graduates in the field was demonstrated Saturday, November 6th, when the "Practical Arts" graduates from all parts of New England got together at the Hotel Budgway in Springfield, Mass., where they banqueted and later listened to a talk by Dean Anthony of the Fitchburg Normal Faculty, who chose as his theme The Birth of Practical Arts, and traced it from its inception in the Fitchburg Normal School to the accomplishments of the present day.

A short business session brought the reunion to a close, at which the officers for the ensuing year were elected. Ralph W. C. Rourke, Buckingham School, Springfield; William M. Donnelly, Metcalf School, Holyoke; Charles H. McGinis, Forest Park School, Springfield.

Rahway, N. J. The high school program has been enlarged with the installation of printing, general science and Spanish courses.

Visiting Teachers of Industrial Art. Thru the aid of the Vocational Society for Shut-Ins in Chicago, Ill., a great many people who are unable on account of some handicap to leave their homes, are carrying on home industries. A visiting industrial art school has been started by the Society. Teachers go to the homes of the shut-ins, provide them with materials and suggest designs and methods of working which will make the results of their handiwork marketable. Starting with simple handicrafts, which require inexpensive materials and little in the way of tools and apparatus, thru such work as braided and hooked rugs, embroidered handkerchiefs and table linen, the society is endeavoring to broaden its work and to place hand looms and other apparatus in homes. Art industries, in which standardized production is not essential, are planned for development by the Society.

Rehabilitation Work in Indiana. Mr. H. G. McComb, Assistant State Vocational Director for Indiana, has laid before the state vocational education board a tentative draft of an agreement to be entered into by the state education board and by the state industrial board, subject to the approval of the Governor, for developing the work of rehabilitation of persons disabled in industry. The work will be supported by federal and state money. The agreement calls for interchange of information and cooperation in reports of disability and placements in positions.

Vocational School Enrollment. The Patterson Vocational School at Paterson, N. J., has an enrollment of 125 men for the evening sessions. The trades taught in the evening are open only to men who work at such trades in their daily employment, which include silk manufacture, silk dyeing, machine shop and pattern shop. There are also classes in shop mathematics and mechanical drafting.

Part Time School Well Attended. The part-time school at the Corning Free Academy for boys and girls of 15 who are not attending high school has an attendance of 17 boys and 14 girls. The boys are given courses in commercial training and the girls domestic training.

Vocational Committee Fixes Wages. Boys who are taking second year of shop work in the vocational training course at Port Huron, Mich., will receive 20 cents an hour for the first six months of service, and 22½ cents for the second six months, the payment being for the actual time of service which is about 1,800 hours. The rate of payment was fixed by the local chamber of commerce and the manufacturers. A council of three has been appointed to consist of a representative of the firm, one from the board of education and one from the chamber of commerce, who will oversee the signing of the agreement of apprenticeship between the student and the employer, and who will investigate any cases of disagreement or trouble. Besides the amount of money agreed upon in the shape of wages, the employer will present the boy at the end of a year's satisfactory service with $10 worth of tools. When his full time thru four years has been completed, he is to be presented with a box or case containing tools to the value of $25.

One School for Four Districts. A certificate of approval has been issued by Dr. Thomas E. Finegan, State Superintendent of Public Instruction of Pennsylvania for the Unionville Joint Consolidated and Vocational High School. The school which is to be located on an eight-

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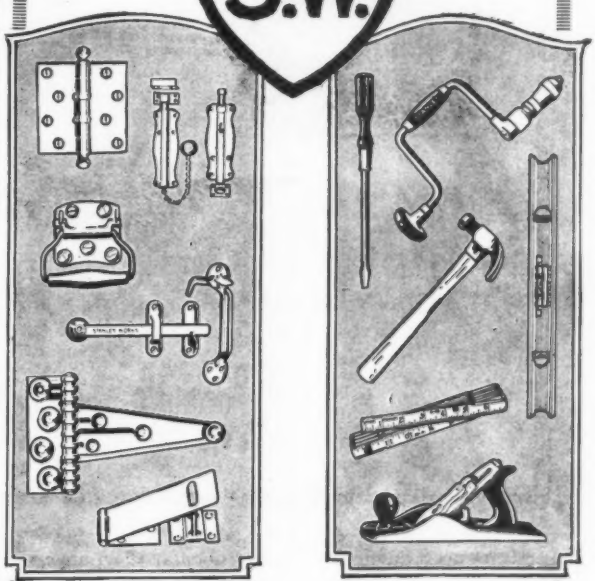

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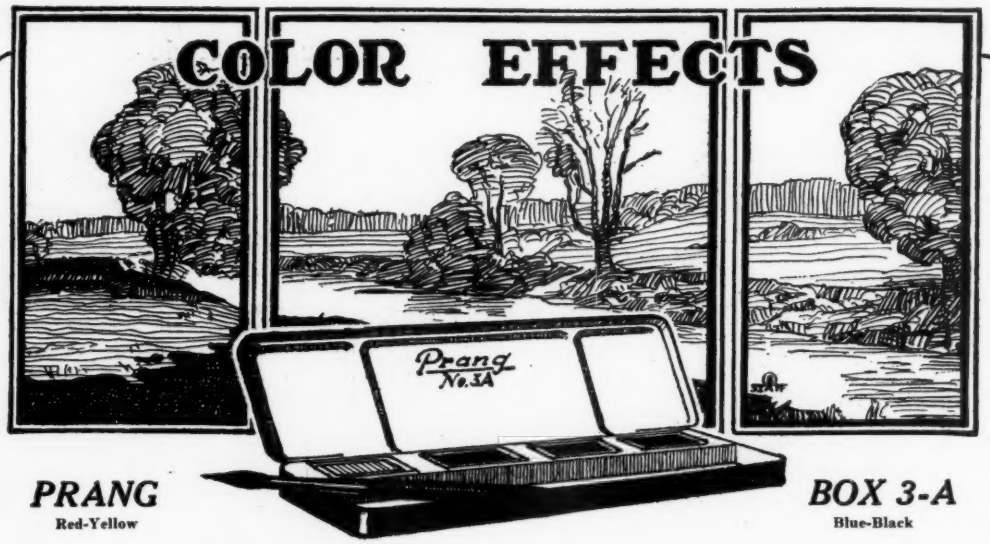

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acre tract near Unionville, Chester County, at an approximate cost of $125,000, will be one of the largest consolidated schools in America. The school has united four township districts, East Marlboro, West Marlboro, Newlin and Pocopson and will accommodate about 125 pupils. The building will take care of eight grade schools and will have a four-year course vocational high school, with thirteen grade teachers and four vocational high school teachers giving full time.

Vocational Talks to High School Students. A new idea in helping high school students in choosing their life's occupation has been initiated by Mr. Collins of the Roundup, Mont., High School. As a result of investigations made in several cities it has been shown that 90 per cent of the high school students have not selected their future occupation. With the idea of forming a decision, half-hour talks at intervals of a few days, by representatives of practically every trade and profession located in Roundup, have been arranged. Each man will explain the qualifications, requirements, returns and possibilities of his particular occupation in detail for the benefit of the students.

Idaho Technical Institute Night School. Night school has been opened at the Idaho Technical Institute at Pocatello, Idaho. Vocational and trade courses will be given special attention. There is a great demand for mechanics and allied courses.

Vocational Education Conferences. Two conferences, one in Salt Lake City and one in Washington, D. C., were held in November, on vocational education, and particularly on industrial rehabilitation of persons disabled by disease or accident. The two conferences were attended by state officials in the vocational education department from each state in the country. Lewis H. Carris, Assistant Director of the Federal Board for Vocational Education, has been given charge of the Industrial Rehabilitation Division of the Federal Board. Among those present at the Salt Lake City meeting were James P. Munroe, Vice-Chairman of the Federal Board for Vocational Education; Layton S. Hawkins, Assistant Director for the Vocational Education Division; Mr. Uel W. Lamkin, Director under the Federal Board for Vocational Education, and Mr. Carris. There were discussions on home economics education, commercial education, the relation of the federal board to the state boards of vocational education, and industrial rehabilitation, by which is meant the application, with state and federal cooperation, to persons injured or disabled in industry, of principles similar to those applied by the United States army for the rehabilitation of its disabled soldiers. Vocational rehabilitation for disabled soldiers, sailors and marines was taken up the last day of the conference.

To Give Scholarship. The Louisville Paint, Oil and Varnish Club has announced an annual scholarship of $300 to be given to the chemistry student of the University of Louisville who makes the most progress in research work in paint, oil and varnish chemistry during the year. The club hopes, by attracting the attention of students along special lines of industrial chemistry, to train men for service in the industrial life of the city and so enhance Louisville's standing as the foremost paint, oil and varnish center south of the Ohio River.

Louisville College of Arts and Science. Louisville has issued municipal bonds to the amount of $1,000,000 to build and equip an adequate plant for the growing needs of the College of Arts and Sciences, University of Louisville. Dr. John L. Patterson, Dean of the University, issued a statement saying that about 82 per cent of the students of the college are from within the city limits and 94 per cent from within a radius of thirty miles of Louisville. The college has won the endorsement of the best educational institutions of the country.

Supervision of Continuation School to be Changed. Superintendent of Schools William R. Peck, at Holyoke, Mass., has asked the regular school board to take charge of the continuation school which is now under the supervision of a board of trustees for vocational education. He claims that vocational education under the board of trustees costs at the rate of $400 per pupil as against $72 per pupil for other schools, and that the entire continuation school system needs reorganization.

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Boys' and Girls' Vocational School. Vocational classes in the schools of Lowell, Mass., have an unusually large attendance this year. There are nine instruction centers in the city, two more than there were last year. Classes in sewing, millinery and handicraft for women are exceedingly large. Employed men 16 or more years of age, may sign up for instruction in the trade at which they are employed during the day. Training is given for machinists, electricians, plumbers, engineers, firemen, carpenters, cabinet makers, chauffeurs and garage men.

School for Mine Workers. Dr. George Michel, President of the School Board of Peoria, Ill., has made plans for the operation of an evening school of instruction in practical coal mining for the benefit of the Peoria miners. These classes will be conducted with the view of promoting efficiency in the industry. There will be classes in arithmetic and elementary subjects, and foreign born workers who do not speak English will be taught the language. While the work will be under the general direction of the board of vocational education, all the expenses will be paid by the school board. The only qualification for entrance in the classes is employment in the mines. Such classes are being conducted in sixteen cities in the state.

Industrial Arts Club Established. The first step toward the formation of an Industrial Arts Club was taken on November 30, at Moorhead, Minn., when a dinner was given at the Annex Hotel. The Club which is composed of industrial arts teachers of the Fargo, Moorhead and Dilworth city schools, North Dakota Agricultural College, Moorhead Normal School and Concordia College, has for its purpose the advancement of the professional interests of teachers and supervisors in the industrial arts. It seeks to promote the special interests of the teachers and to obtain the benefit of group discussion of various subjects. Meetings are to be held once a month, with a selected topic for each meeting. For December the topic was "How I Run My Shop." As officers the club has elected Mr. Kimball of Fargo, President, and Mr. George K. Wells of Moorhead, Secretary.

Crawfordsville, Ind. Courses in vocational information, commercial geography, commercial law, salesmanship, industrial history, sheet metal work, chemistry, vocational agriculture and music are offered. The latter has been entirely reorganized, with a full-time director in charge of all chorus, club, band and orchestra work.

Try-out Courses Offered. Prevocational try-out courses have been introduced in the Junior High School at Minot, N. D., to give boys of the seventh and eighth grades an introduction to such trades as sheet metal work, electricity, printing, woodwork, etc. Classes in the two grades are segregated and the boys pursue work especially adapted to the course selected.

Isaac Delgado Central Trades School, now being erected on City Park Avenue, in New Orleans, will not be completed until about March, 1921. The school has really begun to function thru the establishment of evening classes in the temporary offices of the board located in the Howard Annex to the City Hall. These classes include mechanical drafting of various trades and mathematics for tradesmen, and are not limited as to ages of pupils.

Extend Vocational Education. The program of vocational education at Wabash, Ind., has been enlarged to provide for enlarged courses in evening schools, part-time schools for employed minors, and all-day vocational school work for girls.

The new Academy High School, at Erie, Pa., was opened in September. The building which contains shop accommodations for printing, sheet metal, plumbing, wood working, pattern making, wood finishing, electrical wiring, testing, molding and forging, machine shop practice, drafting, sewing and cookery was erected at a cost of one million dollars.

The shop department is in charge of Mr. Claude McNally, who is assisted by J. F. Faber and Fay Daley in drafting, B. E. Beinlich in related science, T. B. McGraw in pattern making, Paul Cressman in cabinet making, Owen Flickinger in machine shop practice, and Edward Noble in printing. Two-year trade courses for electricians, machinists and pattern makers are offered in the school, and there are more than one hundred applicants for the first year's work in electricity, with more than forty in pattern making and machine shop practice.

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INFORMATION ON HEAT TREATMENT OF METALS.

The Chicago Flexible Shaft Co., Roosevelt Road and Central Ave., Chicago, has recently issued two special numbers of its house organ "The Melting Pot," in which there are special shop talks on heat treatment of metal. Teachers of forging and machine shop practice will find these publications of considerable interest in that they contain hints not usually found in the formal textbooks on the subject. Copies of "The Melting Pot" for November-December which contains a valuable shop talk on carburizing, and copies of the September issue containing talks on annealing and heat treatment of high speed steel will be sent without charge to any teacher.

ISSUES JUNIOR CATALOG.

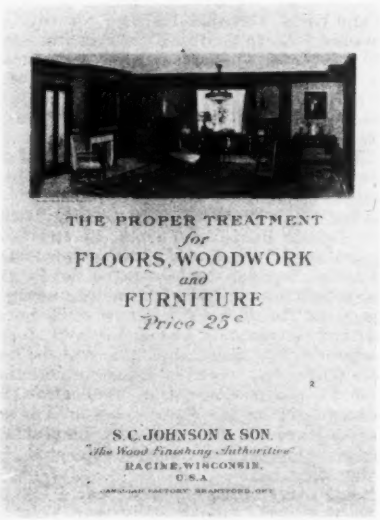
The South Bend Lathe Works has just issued a vest pocket edition of its lathes and machine shop utilities. The booklet contains the complete specifications of the entire South Bend line and in addition some information on the South Bend products.

A WOOD FINISHING BOOK.

The advance along manual training lines has given the wood finishing problem an important place in connection with the finishing of articles made in school shops. The problem is worth special attention for a fine project may be ruined by a poor finish, and a poorly constructed one may be improved if properly finished.

S. C. Johnson & Son, Racine, Wis., have just issued a booklet on wood finishing which is particularly adapted for use in manual training shops. The booklet is of considerable value to schools as it deals with wood finishing problems of a varied character. The entire line of finishes is described and listed in the book and full instructions for using each product are found on the labels of the cans.

Johnson finishes are used in a considerable number of schools and are particularly adapted because of their ease of application, quick-drying qualities, economical use, and wide range of shades.



The firm has an attractive exhibit of wood panels in different finishes which it offers to send to manual training instructors who ask for it.

CHANGES ADDRESS.

The Oliver Machinery Company has removed its Chicago offices from the Railway Exchange Building to 549 West Washington Blvd. The new location is in the heart of the machinery district which has grown up just west of the Northwestern Station.